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Richard S. Eeles,
[illegible]

Robert T. Eeles,
March 3d, 1858

1. The Great Galago 2. The Vison.

3. The American Otter 4. The Red Wolf

5. The Koala.

Lauriliard del. Tucker Sct.

1. Eagle with a gradate tail. 2. The Urubitinga.

3. The Great Harpy. 4. The Crested Honey Buzzard.

5. The Laughing Falcon. 6. Ocyptervs.

Laurillard del. Lacker Sc.

1. Podargus 2. Epimachus magnificus.
3. Philedon monachus. 4. A new Ampelis.
5. The American Ostrich.

Anomalous Mammalia

1. 2. 3. The Aye-Aye

4. 5. 6. The Wombat

THE

ANIMAL KINGDOM

ARRANGED IN CONFORMITY WITH ITS ORGANIZATION,

BY THE BARON CUVIER,

PERPETUAL SECRETARY TO THE ROYAL ACADEMY OF SCIENCES, ETC. ETC. ETC.

THE CRUSTACEA, ARACHNIDES AND INSECTA,

BY P. A. LATREILLE,

MEMBER OF THE ROYAL ACADEMY OF SCIENCES, ETC. ETC. ETC.

TRANSLATED FROM THE FRENCH,

WITH NOTES AND ADDITIONS,

BY H. M'MURTRIE, M.D. &c. &c.

IN FOUR VOLUMES, WITH PLATES

VOLUME I.

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REMARKS.

In presenting to the Zoologist this production of the Aristotle of the nineteenth century, the oracle of his science, it is far from my intention to occupy his time by attempting to show that it is not only the best source of knowledge to which he can refer, that of Nature herself alone excepted, but that it is the only one from which he can be certain of obtaining it unmingled with the grossest error—for this is universally admitted.

Divesting himself of the prejudices arising from a blind reverence for authority and a habit of imitation, our author has brought all the free energies of his powerful and penetrating mind to the investigation of his subject. Perceiving at once the importance of the difference between the constant and mutable characters of animals, aware of the harmony subsisting between one constant character and another, and unappalled by the prospect of the almost endless labour that awaited him, he resolved to expose them with the knife; expecting by the aid of comparative anatomy to arrive at facts which would enable him to arrange the whole animal kingdom, from Man to the last of the Infusoria, in its natural order. How well he has succeeded, the precision with which he has characterized insulated and mutilated fragments of fossil bones of extinct species, and the reconstruction of the whole of their gigantic frames from a part, this book, and the common consent of the learned of all countries, amply testify. He has accomplished the boast of Horace, he has erected the altars of the science in the temple of Truth, and placed its

everlasting foundations on the unchangeable organization of that economy it was his business to study: his monument is imperishable—"*Regalique situ pyramidum altius.*"

When the extent and nature of this work are taken into consideration, it will be readily surmised that my task has been far from an easy one; and a glance at the original is sufficient to convince the scientific critic that such is not only the case, but that the difficulties I have had to encounter were of no ordinary cast. The graceful flexibility of the French language is such as to yield to a combination of words and forms of expression that almost bid defiance to any thing like synonymes in our more stubborn English. If this be true in relation to the language of conversation or that of books on ordinary subjects, how greatly must the difficulty be increased when we find them abounding in a work like this! Such has been my trouble and perplexity on this account, that I may be excused for observing, that although the necessity for making new words cannot be denied, we should never forget that there are but two sources from which they can be legitimately drawn—the Latin or Greek. A word thus formed, being universally understood, may be removed unaltered from one language to another(1).

Previously to commencing the execution of this version, it became indispensably requisite to fix upon some general plan of proceeding. The absurdity of translating into English the technical portion, or the nomenclature, was too apparent to demand a moment's consideration—the genius of our language forbids it. To have left these terms in French would have been inexpedient for self-evident reasons; and the idea of giving a class in Latin, an order in French, &c., presented too revolting a medley. By giving them all in Latin, the common language of science, these objections vanished, although it entailed difficulties of a different character. I have ventured to encounter them; and while strictly adhering to

(1) For some remarks on this subject, see Count Dejean's preface to his Species, &c., I, p. 8.

the spirit, and, as far as practicable, to the very letter of my author, have endeavoured to give to the whole work that classical "form and pressure" which facilitates its study and tends to fix its great and leading points more firmly in the memory. How far I have succeeded others must determine.

I have not forgotten that although this work is more particularly intended to be *studied* by the naturalist, it will probably be *read* by every one who has the slightest desire to acquire some knowledge of the numerous and interesting groups of animals by which Man is surrounded, and with which he is so indissolubly connected. The general reader will lose nothing by the concise and simple style I have endeavoured to adopt; and although the meanings of the names affixed to the various divisions are not placed in glaring characters at their head, he will always find it in the text.

Whenever an animal is mentioned that is generally known by one and the same English, or vulgar name, I have always given it; but of the many thousands here treated of, very few are thus circumstanced, and I cannot but think that it would be advantageous to the science if vulgar names were totally excluded from its nomenclature. The evidence of this is to be found in the fact, that, with comparatively few exceptions, these names vary, not only in different countries, but in different parts of the same country. Thus the *Rockfish* of Philadelphia is a *Striped-Bass* at Boston; the *Sheephead* of Pittsburg (a *Corvina*) is a totally different fish from the one so called in our city (a *Sargus*), and even belongs to a different family; the *Trout* we receive from Long Branch might with equal propriety be denominated a Shark or a Sturgeon. Different names are sometimes attached to the same animal, and the same name to different animals. Vulgar names are a fruitful source of error; and therefore I have employed them as sparingly and as cautiously as possible.

An immaculate book is perhaps rather to be wished for than expected, and that errors should have crept into the Règne Animal is not at all surprizing. These I have endeavoured to correct, not by erasure or altering the text (those cases al-

ways excepted where the mistake was evidently and purely typographical), but by a note, either on the page itself, or in the appendix. Thus, whatever has been added, nothing has been taken away, and the text of my author remains as I found it.

It was originally my intention to have made considerable additions of American species to the Entomology, but to such an extent has the formation of new genera and the division of old ones lately been carried, that it would have required more time to do this correctly than to translate the whole book, and consequently I was compelled to abandon it. Of the Fishes of this country nothing can be said, until we are in possession of the expected work of M. Lesueur.

The period in which America was compelled to look to Europe for a knowledge of her own productions has terminated; and our Wilson, Say, Ord, Le Conte, Harlan, Hentz, Audubon, &c. &c. are repaying the debt with usury. Nor is this spirit of observation abating. The increasing number of institutions exclusively devoted to the natural sciences, in almost every section of our extensive country, shows the reverse to be the fact, and authorizes us to expect the most splendid results from their united efforts.

I cannot conclude without acknowledging my obligations to Major Le Conte for his valuable communications on various portions of the Règne Animal. The results of his critical and laborious investigations are chiefly to be found in the notes on American birds, and the Catalogue which closes this volume, and I have only to regret that the unfinished state of the work on the Lepidoptera of North America, which is now being published at Paris by him and M. Boisduval, prevented me from employing it.

H. M'MURTRIE.

Philadelphia, June 1831.

PREFACE TO THE FIRST EDITION.

Having devoted myself from my earliest youth to the study of comparative anatomy, that is to the laws of the organization of animals and of the modifications this organization undergoes in the various species, and having, for nearly thirty years since, consecrated to that science every moment of which my duties allowed me to dispose, the constant aim of my labours has been to reduce it to general rules, and to propositions which may contain their most simple expression. My first essays soon made me perceive, that I could only attain this in proportion as the animals, whose structure I should have to elucidate, were arranged in conformity with that structure, so that in one single name of class, order, genus, &c. might be embraced all those species which, in their external as well as internal conformation, have affinities either more general or particular. Now this is what the greater number of naturalists of that epoch had never attempted, and what but few of them could have effected, had they even been willing to try, since a similar arrangement presupposes an extensive knowledge of the structures, of which it is partly the representation.

It is true, that Daubenton and Camper had given facts, that Pallas had indicated views: but the ideas of these learned men had not yet exercised upon their contemporaries the influence they merited. The only general catalogue of animals then in existence, and the only one we possess even now, the system of Linnæus, had just been disfigured by an unfortunate editor, who did not even take the pains to examine the prin-

ciples of that ingenious methodist, and who, wherever he found any disorder, seems to have tried to render it more inextricable.

It is also true, that there were very extensive works upon particular classes, which had made known a great number of new species; but their authors merely considered the external relations of those species, and no one had employed himself in arranging the classes and orders from the ensemble of the structure; the characters of several classes remained false or incomplete even in justly celebrated works of anatomy; some of the orders were arbitrary, and in scarcely any of these divisions were the genera placed conformably to nature.

I was compelled then, and the task occupied a considerable period of time, I was compelled to make anatomy and zoology, dissection and classification, the pioneers of my steps; to search for better principles of distribution in my first remarks on organization—to employ them in order to arrive at new ones, and to render the distribution perfect—in fine, from this mutual reaction of the two sciences, to elicit a system of zoology that might serve as an introduction and a guide in anatomical investigations, and as a body of anatomical doctrine fitted to develope and explain the zoological system.

The first results of this double labour appeared in 1795 in a special memoir upon a new division of the white blooded animals. A sketch of their application to genera and to their division in subgenera was the object of my elementary "Tableau Elémentaire des Animaux," printed in 1798, which, in conjunction with M. Dumeril, I improved, in the tables annexed to the first volumes of my "Leçons d'Anatomie Comparée" in 1800.

I should, perhaps, have contented myself with perfecting these tables, and proceeded immediately to the publication of my great work on anatomy, if, in the course of my researches, I had not been frequently struck with another defect of the greater number of the general or partial systems of zoology; I mean the confusion in which the want of critical acumen has left a great number of species, and even several genera.

The classes and orders were not only not sufficiently conformed to the intimate nature of animals to serve conveniently as a basis to a treatise on comparative anatomy, but the genera themselves, although mostly better constituted, presented but inadequate resources, on account of the species not having been arranged under each of them, in conformity with these characters. Thus in placing the Sea-cow (Manatus, Cuv.) in the genus Morse (Trichechus, Lin.), the Siren in that of the Eels, Gmelin had rendered any general proposition relative to the organization of these two genera impossible, just as by approximating to the same class the same order, and placing side by side the Sepia and the fresh-water Polypus, he had made it impossible to say any thing in general on the class and order which embraced such different beings.

The examples above cited are selected from the most striking of these errors; but there existed an infinitude of them, less sensible at the first glance, which presented difficulties not less real.

It was not enough then to have imagined a new arrangement of classes and orders, and to have properly placed the genera there; it was also necessary to examine all the species in order to be assured, whether they really belonged to the genera in which they had been placed.

Having come to this, I found species not only grouped or dispersed, against all semblance of reason, but I remarked that several had not been positively determined; neither by the characters assigned to them, nor by their figures and descriptions.

Here, one of them, by means of synonymes, represents several in one single name, and often so different from each other that they should not be placed in the same genus; there, a single one is doubled, trebled, and successively reappears in several subgenera, genera, and sometimes in different orders.

What shall we say, for instance, of the Trichechus manatus of Gmelin, which in one single specific name comprises three species and two genera; two genera, differing in almost

every thing? By what name shall we speak of the Velella, which figures there twice among the Medusæ and once among the Holothuriæ? How are we to bring together the Biphoræ; some of which are called there Dagysæ, the greater number Salpæ, and several placed among the Holothuriæ.

In order, therefore, completely to attain the object, it was not sufficient to review the species—it was necessary to review their synonymes, or in other words to remodel the system of animals.

Such an enterprise, from the prodigious development of the science in late years, could not have been executed completely by any one individual, even supposing him to have no other employment and to live the longest possible term of years; had I been constrained to depend upon myself alone, I should not have been able to prepare even the simple sketch I now give; but the resources of my position seemed to me to supply what I wanted both of time and talent. Living in the midst of so many able naturalists—drawing from their works as fast as they appeared—enjoying the use of their collections as freely as themselves—and having formed a very considerable one myself especially appropriated to my object; a great portion of my labour consisted merely in the employment of so many rich materials. It was not possible, for instance, that much remained for me to do on shells studied by M. de Lamarck, or on quadrupeds described by M. Geoffroy. The numerous and new affinities observed by M. de Lacepède were so many traits for my system of fishes. Among so many beautiful birds, collected from all parts of the world, M. Le Vaillant perceived details of organization, which I immediately adapted to my plan. My own researches, employed and multiplied by other naturalists, yielded those fruits to me, which, in my hands alone, they would not, all, have produced. Thus, by examining, in the cabinet I have formed, the anatomical preparations on which I designed to found my division of reptiles, M. de Blainville and M. Oppel anticipated (and perhaps better than I could have done) results of which as yet I had but a glimpse, &c., &c.

Encouraged by these reflections, I determined to precede my treatise on comparative anatomy by a kind of abridged system of animals, in which I would present their divisions and subdivisions of all degrees, established in a parallel manner upon their structure, external and internal; where I would give the indication of well ascertained species, which certainly belong to each of the subdivisions, and where, to create more interest, I would enter into some details upon such of those species, which from their abounding in our country, the uses to which we put them, the evils they cause us, the singularity of their habits and economy, their extraordinary forms, their beauty or their size, become the most remarkable.

In so doing, I hoped to prove useful to young naturalists, who, for the most part, have but little idea of the confusion and errors of criticism in which the most accredited works abound, and who, in foreign countries particularly, do not sufficiently attend to the study of the true relations of the conformation of beings; I considered myself as rendering a more direct service to those anatomists, who require to know beforehand to what orders they should direct their researches, when they wish to solve any problem of human anatomy or physiology by comparative anatomy, but whose ordinary occupations do not sufficiently prepare them for fulfilling this condition which is essential to their success.

I had no intention, however, of extending this two-fold view to all the classes of the animal kingdom, and the Vertebrated animals, as in every sense the most interesting, naturally claimed a preference. Among the Invertebrata, I had to study more particularly the naked Mollusca and the great Zoophytes; but the innumerable variations of the external forms of shells and corals, the microscopic animals, and the other families whose part, on the great theatre of nature, is not very apparent, or whose organization affords but little room for the use of the scalpel, did not require a similar minuteness of detail. Independently of this, so far as the shells and corals were concerned, I could depend on the work of

M. de Lamarck, in which will be found all that the most ardent thirst for knowledge can desire.

As regards Insects, which, by their external form, organization, habits, and influence on all animated nature, are so highly interesting, I have been fortunate enough to find assistance, which, in rendering my work infinitely more perfect than it could have possibly been had it emanated from my pen alone, has at the same time considerably accelerated its publication. My friend and colleague M. Latreille, who has studied these animals more profoundly than any other man in Europe, has kindly consented to give, in a single volume, and nearly in the order adopted for the other parts, a summary of his immense researches, and an abridged description of those innumerable genera entomologists are continually establishing.

As for the rest, if in some places I have given less extent to the exposition of subgenera and species, all that relates to the superior divisions and the indicia of relations, I have founded on bases equally solid, by assiduous and universal researches.

I have examined, one by one, all the species of which I could procure specimens; I have approximated those which merely differed from each other in size, colour, or in the number of some parts of little importance, and have formed them into what I denominate subgenera.

Every time it was possible, I dissected one species at least of each subgenus, and if those be excepted to which the scalpel cannot be applied, but very few groups of this degree can be found in my work, of which I cannot produce some considerable portion of the organs.

Having determined the names of the species I observed, which had been previously either well described or well figured, I placed in the same subgenera those I had not seen, but whose exact figures, or descriptions, sufficiently precise to leave no doubt remaining as to their natural relations, I found in authors; but I have passed over in silence that great number of vague indications, on which, in my opinion, naturalists have been too eager to establish species,

whose adoption is what has mainly contributed to introduce in the catalogue of beings, that confusion which deprives it of so great a portion of its utility.

I could, every where, have added great numbers of new species, but as I could not refer to figures it would in that case have been necessary to extend their descriptions beyond the bounds of my limits; I have preferred therefore depriving my work of that ornament, and have indicated those only whose singular formation gives origin to new subgenera.

My subgenera once established on undoubted relations, and composed of well ascertained species, nothing remained but to construct this great scaffolding of genera, tribes, families, orders, classes and divisions which constitute the ensemble of the animal kingdom.

Here I have proceeded, partly by ascending from the inferior to the superior divisions, by means of approximation and comparison, and partly by descending from the superior to the inferior divisions, on the principle of the subordination of characters; carefully comparing the results of the two methods, verifying one by the other, and always sedulously establishing the correspondence of forms, external and internal, both of which constitute integral parts of the essence of each animal.

Such has been my mode of proceeding whenever it was necessary and possible to form new arrangements; but I need not observe, that in many places, the results to which it would have conducted me, had been already so satisfactorily obtained, that no other trouble was left to me than that of following the track of my predecessors. Even in these cases, however, by new observations I have confirmed and verified what was previously acknowledged, and what I did not adopt until it was subjected to a rigorous scrutiny. An idea of this mode of examination may be obtained from the Memoirs on the anatomy of the Mollusca which have appeared in the "Annales du Muséum," and of which I am now preparing a separate and augmented collection. I venture to assure the reader, that the labour I have bestowed upon the Vertebrated animals,

the Annulata, the Radiata, and many of the Insects and Crustacea, is equally extensive. I have not deemed it necessary to publish it with the same detail; but all my preparations are exposed in the Cabinet of Comparative Anatomy in the Jardin du Roi, and will serve hereafter for my Treatise on Anatomy.

Another work of considerable labour, but whose proofs cannot be made so authentic, is the critical examination of species. I examined and verified all the figures adduced by authors, and as often as possible referred each to its true species, before making a choice of those I have pointed out; it is from this verification alone, and never from the classification of preceding methodists, that I have referred to my subgenera the species that belong to them. Such is the reason, why no astonishment should be experienced on finding that such or such a genus of Gmelin is now divided and distributed even in different classes and divisions; that numerous nominal species are reduced to a single one, and that vulgar names are very differently applied.

There is not a single one of these changes that I am not prepared to justify, or of which the reader himself may not obtain the proof by recurring to the sources I have indicated.

In order to diminish his trouble, I have been careful to select for each class a principal author, generally the richest in good original figures, and I quote secondary works only in those cases in which the former are silent, or where it was useful to establish some comparison, for the sake of confirming synonymes.

My subject could have been made to fill many volumes, but I considered it my duty to condense it, by imagining abridged means of publication. I have obtained these by graduated generalities; by never repeating for a species what could be said of a whole subgenus, nor for a genus what might be applied to an entire order, and so on, we arrive at the greatest possible economy of words. To this my endeavours have been, above all, particularly directed, inasmuch as this was the principal end of my work. It may be observed,

however, that I have not employed many technical terms, and that I have endeavoured to communicate my ideas without that barbarous apparatus of factitious words, which, in the works of so many modern naturalists, prove so very repulsive. I cannot perceive, however, that I have thereby lost any thing in precision or clearness.

I have been compelled, unfortunately, to introduce many new names, although I endeavoured as far as possible to preserve those of my predecessors; but the numerous subgenera I have established required these denominations; for in things so various the memory is not satisfied with numerical indications. I have selected them, so as either to convey some character, or among the common names which I have latinized, or finally after the example of Linnæus, from those of mythology, which are generally agreeable to the ear, and which we are far from having exhausted.

In naming species, however, I would recommend employing the substantive of the genus, and the trivial name only. The names of the subgenera are designed as a mere relief to the memory, when we wish to indicate these subdivisions in particular. Otherwise, as the subgenera, already very numerous, will in the end become greatly multiplied, in consequence of having substantives continually to retain, we shall be in danger of losing the advantages of that binary nomenclature so happily imagined by Linnæus.

It is the better to preserve it that I have dismembered, as little as possible, the genera of that illustrious reformer of science. Whenever the subgenera in which I divide them were not to be translated to different families, I have left them together under their former generic appellation. This was not only due to the memory of Linnæus, but it was neeessary in order to preserve the mutual intelligence of the naturalists of different countries.

The habit, naturally acquired in the study of natural history, of the mental classification of a great number of ideas, is one of the advantages of that science that is seldom observed, and which, when it shall have been generally introduced into

the system of common education, will become, perhaps, the principal one. By it, the student is exercised in that part of logic which is termed method, just as he is by geometry in that of syllogism, because natural history is the science which requires the most precise methods, as geometry is that which demands the most rigorous reasoning. Now this art of method, once well acquired, may be applied with infinite advantage to studies the most foreign to natural history. Every discussion which supposes a classification of facts, every research which demands a distribution of matters, is performed according to the same laws; and he who had cultivated this science merely for amusement, is surprised at the facilities it affords him in disentangling and arranging all kinds of affairs.

It is not less useful in solitude. Sufficiently extensive to satisfy the most powerful mind, sufficiently various and interesting to calm the most agitated soul, it sheds consolation in the bosom of the unhappy, and stills the angry waves of envy and hatred. Once elevated to the contemplation of that harmony of nature irresistibly regulated by Providence, how weak and trivial appear those causes which it has been pleased to leave dependent on the will of man! How astonishing to behold so many fine minds, consuming themselves so uselessly for their own happiness or that of others, in the pursuit of vain combinations, whose very traces a few years suffice to sweep away.

I avow it—these ideas have always been present to my mind, the companions of my labours; and if I have endeavoured by every means in my power to advance this peaceful study, it is because, in my opinion, it is more capable than any other of supplying that want of occupation, which has so largely contributed to the troubles of our age—but I must return to my subject.

There yet remains the task of accounting for the principal changes I have effected in the latest received methods, and to acknowledge the amount of my obligations to those naturalists, whose works have furnished or suggested a part of them.

To anticipate a remark which will naturally present itself to many, I must observe that I have neither desired nor pretended to class animals so as to form one single line, or so as to mark their relative superiority. I even consider every attempt of this kind impracticable. Thus, I do not mean that the Mammalia or Birds which come last, are the most imperfect of their class; still less do I believe that the last of the Mammalia are more perfect than the first of the Birds, the last of the Mollusca more so than the first of the Annulata or of the Radiata, even restraining the meaning of this vague word *perfect* to that of most completely organized. I regard my divisions and subdivisions as the merely graduated expression of the resemblance of the beings which enter into each of them, and although in some we observe a sort of degradation or passage from one species to the other, which cannot be denied, this disposition is far from being general. The pretended chain of beings, as applied to the whole creation, is but an erroneous application of those partial observations, which are only true when confined to the limits within which they were made—it has, in my opinion, proved more detrimental to the progress of natural history in modern times, than it is easy to imagine.

It is in conformity with these views that I have established my four general divisions, which have already been made known in a separate Memoir. I still think it expresses the real relations of animals more exactly than the old arrangement of Vertebrata and Invertebrata, for the simple reason, that the former animals have a much greater resemblance to each other than to the latter, and that it was necessary to mark this difference in the extent of their relations.

M. Virey, in an article of the "Nouveau Dictionnaire d'Histoire Naturelle," had already discovered a part of the basis of this division, and principally that which reposes on the nervous system.

The particular approximation of oviparous Vertebrata, inter se, originated from the curious observations of M. Geoffroy on the composition of bony heads; and from those I have

added to them, relative to the rest of the skeleton and to the muscles.

In the Mammalia I have brought back the Solipedes to the Pachydermata, and have divided the latter into families on a new plan; the Ruminantia I have placed after the Quadrupeds, and the Sea-cow near the Cetacea. The arrangement of the Carnaria I have somewhat altered—the Ouistites have been wholly separated from the Monkeys, and a sort of parallelism between the pouched animals and other digitated Mammalia indicated; the whole from my own anatomical researches. All that I have given on the Quadrumana and the Bats is based on the recent and profound labours of my friend M. Geoffroy de Saint-Hilaire. The researches of my brother, M. Frederick Cuvier, on the teeth of the Carnaria and the Rodentia, have proved highly useful to me in forming the subgenera of these two orders. Notwithstanding the genera of the late M. Illiger are but the results of these same studies, and those of some foreign naturalists, I have adopted his names whenever my subgenera could be placed in his genera. I have also adopted M. de Lacépède's excellent divisions of this description, but the characters of all the degrees and all the indications of species have been taken from nature, either in the cabinet of anatomy, or the galleries of the Museum.

The same plan was pursued with respect to the Birds. I have examined with the greatest care and attention more than four thousand individuals in the Museum; I arranged them agreeably to my views in the public gallery more than five years ago, and all that is said of this class has been drawn from that source. Thus, any resemblance which my subdivisions may bear to some recent descriptions is on my side purely accidental(1).

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(1) This observation not having been sufficiently understood abroad, I am compelled to repeat it here, and openly to declare a fact witnessed by thousands in Paris—it is this, that all the birds in the public gallery of the Museum were named and arranged according to my system in 1811. Even such of my subdivisions as I had not yet named were marked by particular signs. This is my date. In-

Naturalists, I hope, will approve of the numerous subgenera I have deemed it necessary to establish among the Birds of Prey, Passerinæ, and Shore-Birds; they appear to me to have completely elucidated genera hitherto involved in much confusion. I have also marked, as exactly as I could, the correspondence of these subdivisions with the genera of MM. de Lacépède, Meyer, Wolf, Temminck, Savigny, and have referred to each of them all the species of which I could obtain a very positive knowledge. This laborious work will prove of value to those who may hereafter attempt a true history of Birds. The splendid works on Ornithology published within a few years, and those chiefly of M. Le Vaillant, which are filled with so many interesting observations, together with M. Vieillot's, have been of much assistance to me in designating with precision the species they represent.

The general division of this class remains as I published it in 1798 in my "Tableau Elémentaire(1)."

The general division of Reptiles, by my friend M. Brongniart, I have thought proper to preserve, but I have prosecuted very extensive and laborious anatomical investigations to obtain my ulterior subdivisions. M. Oppel, as I have already stated, has partly taken advantage of these preparatory labours, and whenever my genera finally agreed with his, I have noticed the fact. The work of Daudin, indifferent as it is, has been useful to me for indications of details, but the particular divisions I have made in the genera Monitor and Gecko, are the product of my own observations on a great number of Reptiles recently brought to the Museum by Messrs Peron and Geoffroy.

My labours with regard to the Fishes will probably be found to exceed those I have bestowed on the other vertebrated

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dependently of this, my first volume was printed in the beginning of 1816. Four volumes are not printed as quickly as a pamphlet of a few pages. I say no more. (Note to Ed. 1829.)

(1) I only mention this, because an amiable naturalist, M. Vieillot, in a recent work has attributed to himself the union of the *Picæ* with the *Passeres*. I had published it in 1798, with my other arrangements, so as to render them public in the Museum since 1811 and 1812.

animals. Since the publication of the celebrated work of M. de Lacépède, the accession to our Museum of a great number of fishes, has enabled me to add several subdivisions to those of that learned naturalist, to form different combinations of several species, and to multiply anatomical observations. I have also had better means of verifying the species of Commerson and of some other travellers, and on this point I owe much to a review of the drawings of Commerson and of the dried fishes he brought with him, by M. Dumeril, which have been but very lately recovered: resources to which I added those presented to me in the fishes brought by Peron from the Indian Ocean and Archipelago; those which I collected in the Mediterranean, and the collections made on the coast of Coromandel by the late M. Sonnerat, at the Isle of France by M. Mathieu, in the Nile and Red Sea by M. Geoffroy, &c. I was thus enabled to verify most of the species of Bloch, Russel, and others, and to have prepared the skeletons and viscera of nearly all the subgenera, so that this portion of the work will, I presume, present to icthyologists much that is new.

As to my division of this class, I confess its inconvenience, but I still think it more natural than any preceding one. When I first published it, I gave it, quantum valeat, and if any one discovers a better principle of division, and as conformable to the organization, I shall hasten to adopt it.

It is well known that all the works, on the general division of the Invertebrated animals, are mere modifications of what I proposed in 1795 in the first of my memoirs; and the time and care I have devoted to the anatomy of the Mollusca in general, and principally to the naked Mollusca, are equally so. The determining of this class, as well as of its divisions and subdivisions, rests on my observations; the magnificent work of M. Poli had alone anticipated me by descriptions and anatomical researches, useful to me it is true, but confined to bivalves and multivalves only. I have verified all the facts furnished to me by that able anatomist, and I have, I think, more justly marked the functions of some organs. I have also endeavoured to determine the animals to which the principal

forms of shells belong, and to arrange the latter from that consideration; but as to the ulterior divisions of those shells whose animals resemble each other, I have examined them only so far as to enable me to describe those admitted by Messrs de Lamarck and de Montfort; even the small number of genera or subgenera which are properly mine, are derived from observations on the animals. In citing examples I have confined myself to a certain number of the species of Martini, Chemnitz, Lister, and that only (the volume of M. de Lamarck, which is to contain these matters, not being published), because I was compelled to fix the attention of the reader on specific objects. In the selection and determining of these species however I lay no claim to the same critical accuracy I have employed for the Vertebrated animals and the naked Mollusca.

The excellent observations of Messrs Savigny, Lesueur, and Desmarest on the compound Ascidia, approximate the latter family of the Mollusca to certain orders of Zoophytes—a curious relation, and an additional proof of the impracticability of arranging animals on one single line.

The Annulata (the establishing of which order, although not the name, belongs de facto to me) have I think been extricated from the confusion in which they had hitherto been involved among the Mollusca, the Testacea, and the Zoophytes, and placed in their natural order—even their genera have been elucidated only by my observations on them, published in the "Dictionnaire des Sciences Naturelles," and elsewhere.

I can say nothing relative to the three classes contained in the third volume. M. Latreille, who, with the exception of some anatomical details, founded on my own observations and those of M. Randohr, added to his text, is its sole author, will spare me that trouble.

As to the Zoophytes, which terminate the animal kingdom, I have availed myself, for the Echinodermata, of the late work of M. de Lamarck, and for the Intestinal Worms, of that of M. Rudolphi, entitled *Entozoa;* but I have anatomized all the genera, some of which have been determined by me only.

Besides this, there is an excellent work of M. Tiedemann on the anatomy of the Echinodermata that received the prize of the Institute some years ago, that will shortly appear—it will leave nothing unsaid with respect to these curious animals. The Corals and the Infusoria, allowing no field for anatomical investigations, have been briefly disposed of. The new work of M. de Lamarck will supply my deficiencies(1).

With respect to authors, I can only mention, here, those who have furnished me with general views, or who were the origin of such in my own mind(2). There are many others to whom I am indebted for particular facts, whose names I have carefully quoted wherever I have made use of them. They will be found on every page of my book. Should I have omitted to do justice to any, it must be attributed to involuntary forgetfulness—no property, in my eyes, is more sacred than the conceptions of the mind, and the custom, too common among naturalists, of making plagiarisms by a change of names, has always appeared to me a crime.

The publication of my Comparative Anatomy will now occupy me every moment; the materials are ready, great quantities of preparations and drawings are finished and arranged; and I shall be careful in dividing the work into parts, each of which will form a whole, so that should my physical powers prove insufficient for the completion of the totality of my plan, what I shall have produced will still form entire suites, and the materials I have collected be ready for the hand of him who may undertake the continuation of my labours.

Jardin du Roi, 1816.

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(1) I have this moment received, *l'Histoire des Polypiers coralligènes flexibles* of M. Lamouroux, which furnishes an excellent supplement to M. Lamarck.

(2) M. de Blainville has recently published general zoological tables, which I regret came too late for me to profit by; having appeared when my book was nearly printed.

PREFACE TO THE SECOND EDITION.

The preceding preface exhibits a faithful account of the state in which I found the history of animals at the time the first edition of this work was published. During the twelve years that have since elapsed, this science has made immense progress. The labours of numerous, courageous, and learned travellers, who have explored every region of the globe, the rich collections formed and rendered public by various governments, the profound and splendid works where new species are described and figured, and whose authors have been determined to detect their mutual relations and to consider them in every light(1), have all been instrumental in producing this result.

I have endeavoured to avail myself of these discoveries, as far as my plan permitted, by first studying the innumerable specimens received at the Cabinet du Roi, and comparing them with those which served as the basis of my first edition, in order to deduce thence new approximations or new subdivisions, and then by searching in all the books I could procure for the genera or subgenera established by naturalists, and the description of species by which they have supported these different combinations.

The study of synonymes has become much easier now than it was at the period of my first edition. Both French and

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(1) See my Discourse before the Institute on the "Progrès de l'Histoire Naturelle depuis la paix maritime," published in the third volume of my "Eloges."

foreign naturalists seem to have felt the necessity of establishing divisions in those immense genera, in which such incongruous species were formerly heaped together; their groups are now precise and well defined, their descriptions sufficiently detailed, their figures scrupulously exact even to the most minute characters, and very frequently of the greatest beauty. Scarcely any difficulty remains therefore in determining the identity of their species, and nothing hinders them from coming to an understanding with respect to the nomenclature. This, unfortunately, has been almost neglected; the names of the same genera, the same species, are multiplied as often as they are spoken of; and should this discord continue, the same chaos will be produced that previously existed, though arising from a different cause.

I have used every effort to compare and approximate these redundancies, and forgetting even my own little interest of author, have often given names which seem to have been formed expressly to avoid being compelled to avow the *borrowing* of my divisions. But in order thoroughly to execute this undertaking, this pinax of the animal kingdom, which becomes daily more and more necessary, to examine its proofs, and to fix on the definite nomenclature that would be adopted, by basing it on sufficient figures and descriptions, requires more space than I can dispose of, and a time imperiously claimed by other works. It is in the "History of Fishes," which, assisted by M. Valenciennes, I have commenced publishing, that I intend to give an idea of what I think might be effected with respect to all parts of the science. This is a mere abridgement, a simple sketch—fortunate will I be if I succeed in rendering it correct in all its parts.

Various descriptions of a similar kind have been published on some of the classes, and I have carefully studied them all, in order to perfect my own. The "Mammalogie" of M. Desmarest, that of M. Lesson, the "Traité sur les Dents des Quadrupèdes" of M. Frederick Cuvier, the English translation of my first edition by Mr Griffith enriched by numerous additions chiefly by Hamilton Smith, the new edition of the "Ma-

nuel d'Ornithomalogie" of M. Temminck, the "Ornithological Fragments" of M. Wagler, the "Description of Reptiles" by the late Merrem, and the dissertation on the same subject by M. Fitzinger, were principally useful to me for the Vertebrated animals. The "Histoire des Animaux sans Vertebres" of M. de Lamarck, and the "Malacologie" of M. de Blainville, were also of great use to me for the Mollusca. To these I have added the new views and facts contained in the numerous and learned writings of Messrs Geoffroy Saint-Hilaire, father and son, Savigny, Temminck, Lichtenstein, Kuhl, Wilson, Horsfield, Vigors, Swainson, Gray, Ord, Say, Harlan, Charles Bonaparte, Lamouroux, Mitchell, Lesueur, and many other able and studious men, whose names will be carefully mentioned, wherever I speak of the subjects they have described.

The fine collection of engravings which have appeared within the last twelve years, have allowed me to indicate a greater number of species, nor have I failed to make ample use of the opportunity. I must particularly acknowledge what I owe on this score, to the "Histoire des Mammifères" of MM. Geoffroy Saint-Hilaire and Frederick Cuvier, the "Planches Coloriées" of Messrs Temminck and Laugier, the "Galerie des Oiseaux" of M. Vieillot, the new edition of the "Oiseaux d'Allemagne" of M. Nauman, the Birds of the United States of Messrs Wilson, Ord, and Charles Bonaparte(1), the great works of M. Spix and of the prince Maximilian de Wied on the animals of Brazil, and to those of M. Ferussac on the Mollusca. The plates and zoological descriptions of the travels of Messrs Freycinet and Duperrey, given in the first by Messrs Quoy and Gaymard, and in the second by Messrs Lesson and Garnot, present, also, many new objects. The same should be said of the animals of Java, by M. Horsfield. Though on a smaller scale, new figures of rare species are to be found in the "Memoires du Muséum," in the "Annales des Sciences Naturelles," in the different dictionaries of the natural sciences, in

(1) The work of M. Audubon upon the Birds of North America, which surpasses all others in magnificence, was unknown to me till after the whole of that part which treats of birds was printed.

the Zoological Illustrations of M. Swainson, and in the Zoological Journal published by able naturalists in London. The Journals of the Lyceum of New York, and of the Academy of Natural Sciences of Philadelphia, are not less precious; but in proportion as the taste for natural history becomes extended, and the more numerous the countries in which it is cultivated, the number of its acquisitions increase in geometrical progression, and it becomes more and more difficult to collect all the writings of naturalists, and to complete the table of their results; I rely therefore on the indulgence of those whose observations may have escaped me, or whose works I may not have sufficiently studied.

My celebrated friend and colleague M. Latreille, as in the first edition, having consented to take upon himself the important and difficult subject of the Crustacea, Arachnides and Insects, will himself point out the path he has pursued; so that on these points I need say nothing more here.

Jardin du Roi, October 1828.

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INTRODUCTION.

As correct ideas respecting natural history are not very generally formed, it appears necessary to begin by defining its peculiar object, and establishing rigorous limits between it and neighbouring sciences.

In our language and in most others, the word NATURE is variously employed. At one time it is used to express the qualities a being derives from birth, in opposition to those it may owe to art; at another, the entire mass of beings which compose the universe; and at a third, the laws which govern those beings. It is in this latter sense particularly that we usually personify nature, and, through respect, use its name for that of its Creator.

Physics, or Natural Philosophy, treats of the nature of these three relations, and is either general or particular. General physics examines abstractedly each of the properties of those movable and extended beings we call bodies. That branch of them styled Dynamics, considers bodies in mass; and proceeding from a very small number of experiments, determines mathematically the laws of equilibrium, and those of motion and of its communication. Its different divisions are termed Statics, Hydrostatics, Hydrodynamics, Mechanics, &c. &c., according to the nature of the particular bodies whose motions it examines. Optics considers the particular motions of light, whose phenomena, which hitherto nothing but experiment has been able to determine, are becoming more numerous.

Chemistry, another branch of general physics, exposes the laws by which the elementary molecules of bodies act on each

other; the combinations or separations which result from the general tendency of these molecules to re-unite; and the modifications which the various circumstances capable of separating or approximating them produce on that tendency. It is purely a science of experiment, and is irreducible to calculation.

The theory of heat and that of electricity belong either to dynamics or chemistry, according to the point of view in which they are considered.

The ruling method in all the branches of general physics consists in isolating bodies, reducing them to their greatest simplicity, in bringing each of their properties separately into action, either by reflection or experiment, and by observing or calculating the results; and finally, in generalising and connecting the laws of these properties, so as to form codes, and, if it were possible, to refer them to one single principle into which they might all be resolved.

The object of *Particular Physics*, or of *Natural History*—for the terms are synonymous—is the special application of the laws recognised by the various branches of general physics to the numerous and varied beings which exist in nature, in order to explain the phenomena which each of them presents.

Within this extensive range, astronomy also would be included; but that science, sufficiently elucidated by mechanics, and completely subjected to its laws, employs methods, differing too widely from those required by natural history, to permit it to be cultivated by the students of the latter.

Natural history, then, is confined to objects which do not allow of exact calculation, nor of precise measurement in all their parts. Meteorology also is substracted from it and united to general physics; so that, properly speaking, it considers only inanimate bodies called minerals, and the different kinds of living beings, in all of which we may observe the effects, more or less various, of the laws of motion and chemical attraction, and of all the other causes analysed by general physics.

Natural history, in strictness, should employ similar methods with the general sciences; and it does so, in fact, whenever the

objects it examines are sufficiently simple to allow it. This, however, is but very rarely the case.

An essential difference between the general sciences and natural history is, that in the former, phenomena are examined, whose conditions are all regulated by the examiner, in order, by their analysis, to arrive at general laws; whereas in the latter, they take place under circumstances beyond the control of him who studies them for the purpose of discovering amid the complication, the effects of known general laws. He is not, like the experimenter, allowed to subtract them successively from each condition, and to reduce the problem to its elements—he is compelled to take it in its entireness, with all its conditions at once, and can perform the analysis only in thought. Suppose, for example, we attempt to insulate the numerous phenomena which compose the life of any of the higher orders of animals; a single one being suppressed, every vestige of life is annihilated.

Dynamics have thus nearly become a science of pure calculation; chemistry is still a science of pure experiment; and natural history, in a great number of its branches, will long remain one of pure observation.

These three terms sufficiently designate the methods employed in the three branches of the natural sciences; but in establishing between them very different degrees of certitude, they indicate, at the same time, the point to which they should incessantly tend, in order to attain nearer and nearer to perfection.

Calculation, if we may so express it, thus commands nature, and determines her phenomena more exactly than observation can make them known; experiment compels her to unveil; while observation pries into her secrets when refractory, and endeavours to surprise her.

There is, however, a principle peculiar to natural history, which it uses with advantage on many occasions; it is that of *the conditions of existence*, commonly styled *final causes*. As nothing can exist without the re-union of those conditions which render its existence possible, the component parts of each being must be so arranged as to render possible the whole

being, not only with regard to itself but to its surrounding relations. The analysis of these conditions frequently conducts us to general laws, as certain as those that are derived from calculation or experiment.

It is only when all the laws of general physics and those which result from the conditions of existence are exhausted, that we are reduced to the simple laws of observation.

The most effectual method of obtaining these, is that of comparison. This consists in successively observing the same bodies in the different positions in which nature places them, or in a mutual comparison of different bodies; until we have ascertained invariable relations between their structures and the phenomena they exhibit. These various bodies are kinds of experiments ready prepared by nature, who adds to or deducts from each of them different parts, just as we might wish to do in our laboratories; showing us, herself, at the same time their various results.

In this way we finally succeed in establishing certain laws by which these relations are governed, and which are employed like those that are determined by the general sciences.

The incorporation of these laws of observation with the general laws, either directly or by the principle of the conditions of existence, would complete the system of the natural sciences, in rendering sensible in all its parts the mutual influence of every being. To this end, should those who cultivate these sciences direct all their efforts.

All researches of this nature, however, pre-suppose means of distinguishing clearly, and causing others to distinguish, the bodies they are occupied with; otherwise we should be continually confounding them. Natural history then should be based on what is called a *system of nature;* or a great catalogue in which all created beings have suitable names, may be recognised by distinctive characters, and be arranged in divisions and subdivisions, themselves named and characterised, in which they may be found.

In order that each being may be recognised in this catalogue, it must be accompanied by its character: habits or properties

which are but momentary cannot, then, furnish characters—they must be drawn from the conformation.

There is scarcely a single being which has a simple character, or can be recognised by one single feature of its conformation; a union of several of these traits are almost always required to distinguish one being from those that surround it, who also have some but not all of them, or who have them combined with others of which the first is destitute. The more numerous the beings to be distinguished, the greater should be the number of traits; so that to distinguish an individual being from all others, a complete description of it should enter into its character.

It is to avoid this inconvenience, that divisions and subdivisions have been invented. A certain number only of neighbouring beings are compared with each other, and their characters need only to express their differences, which, by the supposition itself, are the least part of their conformation. Such a re-union is termed a *genus*.

The same inconvenience would be experienced in distinguishing genera from each other, were it not for the repetition of the operation in uniting the adjoining genera, so as to form an *order*, the orders to form a *class*, &c. Intermediate subdivisions may also be established.

This scaffolding of divisions, the superior of which contain the inferior, is called a *method*. It is in some respects a sort of dictionary, in which we proceed from the properties of things to arrive at their names; being the reverse of the common ones, in which we proceed from the name to arrive at the property.

When the method is good, it does more than teach us names. If the subdivisions have not been established arbitrarily, but are based on the true fundamental relations, on the essential resemblances of beings, the method is the surest means of reducing the properties of beings to general rules, of expressing them in the fewest words, and of stamping them on the memory.

To render it such, we employ an assiduous comparison of beings, directed by the principle of the *subordination of cha-*

racters, which is itself derived from that of the conditions of existence. The parts of a being possessing a mutual adaptation, some traits of character exclude others, while on the contrary, there are others that require them. When, therefore, we perceive such or such traits in a being, we can calculate before hand those that co-exist in it, or those that are incompatible with them. The parts, the properties, or the traits of conformation, which have the greatest number of these relations of incompatibility or of co-existence with others, or, in other words, that exercise the most marked influence upon the whole of the being, are called the *important characters, dominating characters;* the others are the *subordinate characters,* all varying in degree.

This influence of characters is sometimes determined rationally, by the consideration of the nature of the organ. When this is impracticable, we have recourse to simple observation; and a sure mark by which we may recognise the important characters, and one which is drawn from their own nature, is their superior constancy, and that in a long series of different beings, approximated according to their degrees of similitude, these characters are the last to vary. That they should be preferred for distinguishing the great divisions, and that in proportion as we descend to the inferior subdivisions, we can also descend to subordinate and variable characters, is a rule resulting equally from their influence and constancy.

There can be but one perfect method, which is the *natural method.* We thus name an arrangement in which beings of the same genus are placed nearer to each other than to those of the other genera; the genera of the same order nearer than those of the other orders, &c. &c. This method is the *ideal* to which natural history should tend; for it is evident that if we can reach it, we shall have the exact and complete expression of all nature. In fact, each being is determined by its resemblance to others, and difference from them; and all these relations would be fully given by the arrangement in question. In a word, the natural method would be the whole science, and every step towards it tends to advance the science to perfection.

Life being the most important of all the properties of beings, and the highest of all characters, it is not surprising that it has in all ages been made the most general principle of distinction; and that natural beings have always been separated into two immense divisions, the *living* and the *inanimate*.

Of Living Beings, and Organization in general.

If, in order to obtain a correct idea of the essence of life, we consider it in those beings in which its effects are the most simple, we quickly perceive that it consists in the faculty possessed by certain corporeal combinations, of continuing for a time and under a determinate form, by constantly attracting into their composition a part of surrounding substances, and rendering to the elements, portions of their own.

Life then is a vortex, more or less rapid, more or less complicated, the direction of which is invariable, and which always carries along molecules of similar kinds, but into which individual molecules are continually entering, and from which they are continually departing; so that the *form* of a living body is more essential to it than its *matter*.

As long as this motion subsists, the body in which it takes place is living—*it lives*. When it finally ceases, *it dies*. After death, the elements which compose it, abandoned to the ordinary chemical affinities, soon separate, from which, more or less quickly, results the dissolution of the once living body. It was then by the vital motion that its dissolution was arrested, and its elements were held in a temporary union.

All living bodies die after a certain period, whose extreme limit is fixed for each species, and death appears to be a necessary consequence of life, which, by its own action, insensibly alters the structure of the body, so as to render its continuance impossible.

In fact, the living body undergoes gradual, but continual changes, during the whole term of its existence. At first, it increases in dimensions, according to proportions, and within limits, fixed for each species and for each one of its parts; it then augments in density in the most of its parts:—it is this

second kind of change that appears to be the cause of natural death.

If we examine the various living bodies more closely, we find they possess a common structure, which a little reflection soon causes us to perceive is essential to a vortex such as the vital motion.

Solids, it is plain, are necessary to these bodies, for the maintenance of their forms; and fluids for the conservation of motion in them. Their tissue, accordingly, is composed of network and plates, or of fibres and solid laminæ, within whose interstices are contained the fluids; it is in these fluids that the motion is most continued and extended. Foreign substances penetrate the body and unite with them; they nourish the solids by the interposition of their molecules, and also detach from them those that are superfluous. It is in a liquid or gaseous form that the matters to be exhaled traverse the pores of the living body; but in return, it is the solids which contain the fluids, and by their contraction communicate to them part of their motion.

This mutual action of the fluids and solids, this transition of molecules, required considerable affinity in their chemical composition; and such is the fact—the solids of organized bodies being mostly composed of elements easily convertible into fluids or gases.

The motion of the fluids needing also a constantly repeated action on the part of the solids, and communicating one to them, required in the latter both flexibility and dilatability; and accordingly we find this character nearly general in all organized solids.

This structure, common to all living bodies; this areolar tissue, whose more or less flexible fibres or laminæ intercept fluids more or less abundant; constitutes what is called the *organization*. As a consequence of what we have said, it follows, that life can be enjoyed by organized bodies only.

Organization, then, results from a great variety of arrangements, which are all conditions of life; and it is easy to conceive, that if its effect be to alter either of these conditions, so

as to arrest even one of the partial motions of which it is composed, the general movement of life must cease.

Every organized body, independently of the qualities common to its tissue, has a form peculiar to itself, not merely general and external, but extending to the detail of the structure of each of its parts; and it is upon this form, which determines the particular direction of each of the partial movements that take place in it, that depends the complication of the general movement of its life—it constitutes its species and renders it what it is. Each part co-operates in this general movement by a peculiar action, and experiences from it particular effects, so that in every being life is a whole, resulting from the mutual action and re-action of all its parts.

Life, then, in general, pre-supposes organization in general, and the life proper to each individual being pre-supposes an organization peculiar to that being, just as the movement of a clock pre-supposes the clock; and accordingly we behold life only in beings that are organized and formed to enjoy it, and all the efforts of philosophy have never been able to discover matter in the act of organization, neither per se, nor by any external cause. In fact, life exercising upon the elements which at every moment form part of the living body, and upon those which it attracts to it, an action contrary to that which, without it, would be produced by the usual chemical affinities, it seems impossible that it can be produced by these affinities, and yet we know of no other power in nature capable of re-uniting previously separated molecules.

The birth of organized beings is, therefore, the greatest mystery of the organic economy and of all nature: we see them developed, but never being formed; nay more, all those whose origin we can trace, have at first been attached to a body similar in form to their own, but which was developed before them—in a word, to a *parent*. So long as the offspring has no independent existence, but participates in that of its parent, it is called a *germ*.

The place to which the germ is attached, and the cause which detaches it and gives it an independent life, vary; but

this primitive adhesion to a similar being, is a rule without exception. The separation of the germ is called *generation*.

Every organized being re-produces others that are similar to itself, otherwise, death being a necessary consequence of life, the species would become extinct.

Organized beings have even the faculty of reproducing, in degrees varying with the species, particular parts of which they may have been deprived—this is called the *power of re-production*.

The development of organized beings is more or less rapid, and more or less extended, as circumstances are more or less favourable. Heat, the abundance and species of nutriment, with other causes, exercise great influence, and this influence may extend to the whole body in general, or to certain organs in particular: thence arises the impossibility of a perfect similitude between the offspring and parent.

Differences of this kind, between organized beings, form what are termed *varieties*.

There is no proof, that all the differences which now distinguish organized beings, are such as may have been produced by circumstances. All that has been advanced upon this subject is hypothetical. Experience, on the contrary, appears to prove, that, in the actual state of the globe, varieties are confined within rather narrow limits, and go back as far as we may, we still find those limits the same.

We are thus compelled to admit of certain forms, which, from the origin of things, have perpetuated themselves without exceeding these limits, and every being appertaining to one or other of these forms, constitutes what is termed a *species*. *Varieties* are accidental subdivisions of species.

Generation being the only means of ascertaining the limits to which varieties may extend, species should be defined, *the re-union of individuals descended one from the other, or from common parents, or from such as resemble them, as strongly as they resemble each other*. But although this definition is strict, it will be seen that its application to particular individuals may be very difficult, where the necessary experiments have not been made.

Thus then it stands—absorption, assimilation, exhalation, development and generation are functions common to all living bodies; birth and death the universal limits of their existence; an areolar, contractile tissue, containing within its laminæ fluids or gases in motion, the general essence of its structure; substances almost all susceptible of conversion into fluids or gases, and combinations capable of an easy and mutual transformation, the basis of their chemical composition. Fixed forms that are perpetuated by generation distinguish their species, determine the complication of the secondary functions proper to each of them, and assign to them the parts they are to play on the great stage of the universe. These forms are neither produced nor changed by their own agency—life supposes their existence, its flame can only be kindled in an organization already prepared, and the most profound meditation and lynx-eyed and delicate observation can penetrate no farther than the mystery of the pre-existence of germs.

Division of Organized Beings into Animals and Vegetables.

Living or organized beings have always been subdivided into *animate beings*, that is, such as are possessed of sense and motion, and into *inanimate beings*, which are deprived of both these faculties, and are reduced to the simple faculty of vegetating. Although the leaves of several plants shrink from the touch, and the roots are steadily directed towards moisture, the leaves to light and air, and though parts of vegetables appear to oscillate without any apparent external cause, still these various motions have too little similarity to those of animals, to enable us to find in them any proofs of perception or will.

The spontaneity in the motions of animals required essential modifications even in their purely vegetative organs. Their roots not penetrating the earth, it was necessary they should be able to place within themselves a supply of aliment, and to carry its reservoir along with them. Hence is derived the first character of animals, or their alimentary canal, from

which their nutritive fluid penetrates all other parts through pores or vessels, which are a kind of internal roots.

The organization of this cavity and its appurtenances required varying, according to the nature of the aliment, and the operation it had to undergo, before it could furnish juices fit for absorption; whilst the air and earth present to vegetables nought but elaborated juices ready for absorption.

The animal, whose functions are more numerous and varied than those of the plant, consequently necessitated an organization much more complete; besides this, its parts not being capable of preserving one fixed relative position, there were no means by which external causes could produce the motion of their fluids, which required an exemption from atmospheric influence; from this originates the second character of animals, *their circulating system*, one less essential than that of digestion, since in the more simple animals it is unnecessary. The animal functions required organic systems, not needed by vegetables—that of the muscles for voluntary motion, and nerves for sensibility; and these two systems, like the rest, acting only through the motions and transformations of the fluids, it was necessary that these should be most numerous in animals, and that the chemical composition of the animal body be more complex than that of the plant; and so it is, for one substance more (azote) enters into it as an essential element, whilst in plants it is a mere accidental junction with the three other general elements of organization, oxygen, hydrogen, and carbon. This then is the third character of animals.

From the sun and atmosphere, vegetables receive for their nutrition water, which is composed of oxygen and hydrogen; air, which contains oxygen and azote; and carbonic acid, which is a combination of oxygen and carbon. To extract their own composition from these aliments, it was necessary they should retain the hydrogen and carbon, exhale the superfluous oxygen and absorb little or no azote. Such, in fact, is vegetable life, whose essential function is the exhalation of oxygen, which is effected through the agency of light.

Animals also derive nourishment, directly or indirectly, from the vegetable itself, in which hydrogen and carbon form

the principal parts. To assimilate them to their own composition, they must get rid of the superabundant hydrogen and carbon in particular, and accumulate more azote, which is performed through the medium of respiration, by which the oxygen of the atmosphere combines with the hydrogen and carbon of their blood, and is exhaled with them in the form of water and carbonic acid. The azote, whatever part of the body it may penetrate, seems always to remain there.

The relations of vegetables and animals to the surrounding atmosphere are therefore in an inverse ratio—the former reject water and carbonic acid, while the latter produce them. The essential function of the animal body is respiration, it is that which in a manner animalizes it, and we shall see that the animal functions are the more completely exercised, in proportion to the greatness of the powers of respiration possessed by the animal. This difference of relations constitutes the fourth character of animals.

Of the forms peculiar to the Organic Elements of the Animal Body, and of the principal combinations of its Chemical Elements.

An areolar tissue and three chemical elements are essential to every living body; there is a fourth element peculiarly requisite to that of an animal; but this tissue is composed of variously formed meshes, and these elements are variously combined.

There are three kinds of organic materials or forms of texture, the *cellular membrane*, the *muscular fibre*, and the *medullary matter*, and to each form belongs a peculiar combination of chemical elements, as well as a particular function.

The *cellular substance* is composed of an infinity of small fibres and laminæ, fortuitously disposed, so as form little cells that communicate with each other. It is a kind of sponge, which has the same form as the body, all other parts of which traverse or fill it, and contracting indefinitely, on the removal of the causes of its tension. It is this power that retains the body in a given form and within certain limits.

When condensed, this substance forms those laminæ called *membranes;* the membranes, rolled into cylinders, form those more or less ramified tubes named *vessels;* the filaments called *fibres* are resolved into it, and bones are nothing but the same thing indurated by the accumulation of earthy particles.

The cellular substance consists of a combination well known as *gelatine,* characterised by its solubility in boiling water, and forming, when cold, a trembling jelly.

We have not yet been able to reduce the *medullary matter* to its organic molecules; to the naked eye, it appears like a sort of soft bouillie, consisting of excessively small globules; it is not susceptible of any apparent motion, but in it resides the admirable power of transmitting to the ME the impressions of the external senses, and conveying to the muscles the orders of the will. It constitutes the greater portion of the brain and the spinal marrow, and the nerves which are distributed to all the sentient organs are, essentially, mere fasciculi of its ramifications.

The *fleshy* or *muscular fibre* is a peculiar sort of filament, whose distinctive property, during life, is that of contracting when touched or struck, or when it experiences the action of the will through the medium of the nerve.

The muscles, direct organs of voluntary motion, are mere bundles of fleshy fibres. All vessels and membranes which have any kind of compression to execute are armed with these fibres. They are always intimately connected with nervous threads, but those which belong to the purely vegetative functions contract, without the knowledge of the ME, so that, although the will is truly a means of causing the fibres to act, it is neither general nor unique.

The fleshy fibre has for its base a particular substance called *fibrine,* which is insoluble in boiling water, and which seems naturally to assume this filamentous disposition.

The *nutritive fluid* or *the blood,* such as we find it in the vessels of the circulation, is not only mostly resolvable into the general elements of the animal body, carbon, hydrogen, oxygen and azote, but it also contains fibrine and gelatine, almost prepared to contract and to assume the forms of membranes

or filaments peculiar to them, all that is ever wanted for their manifestation being a little repose. The blood also contains another combination, which is found in many animal fluids and solids, called *albumen*, whose characteristic property is that of coagulating in boiling water. Besides these, the blood contains almost every element which may enter into the composition of the body of each animal, such as the *lime* and *phosphorus* which harden the bones of vertebrated animals, the *iron* from which it and various other parts receive their colour, the *fat* or animal oil which is deposited in the cellular substance to supple it, &c. All the fluids and solids of the animal body are composed of chemical elements found in the blood, and it is only by possessing a few elements more or less, that each of them is distinguished; whence it is plain, that their formation entirely depends on the subtraction of the whole or part of one or more elements of the blood, and in some few cases, on the addition of some element from elsewhere.

These operations, by which the blood nourishes the fluid or solid matter of all parts of the body, may assume the general name of *secretions*. This name, however, is often appropriated exclusively to the production of liquids; while that of *nutrition* is more especially applied to the formation and deposition of the matter necessary to the growth and conservation of the solids.

The composition of every solid organ, of every fluid is precisely such as fits it for the part it is to play, and it preserves it as long as health remains, because the blood renews it as fast as it becomes changed. The blood itself by this continued contribution is changed every moment, but is restored by digestion, which renews its matter by respiration, which delivers it from superfluous carbon and hydrogen, by perspiration and various other excretions, that relieve it from other superabundant principles.

These perpetual changes of chemical composition form a part of the vital vortex, not less essential than the visible movements and those of translation. The object of the latter is, in fact, but to produce the former.

Of the forces which act in the Animal Body.

The muscular fibre is not only the organ of voluntary motion, for we have just seen that it is also the most powerful of the agents employed by nature to produce those transmutations so necessary to vegetative life. Thus the fibres of the intestines produce the peristaltic motion, which causes the alimentary matter therein contained to pass through them; the fibres of the heart and arteries are the agents of the circulation and through it of all the secretions, &c.

Volition contracts the fibre through the medium of the nerve; and the involuntary fibres, such as those we have mentioned, being also animated by them, it is probable that these nerves are the cause of their contraction.

All contraction, and generally speaking, every change of dimension in nature, is produced by a change of chemical composition, though it consist merely in the flowing or ebbing of an imponderable fluid, such as caloric; thus also are produced the most violent movements known upon earth, explosions, &c.

There is, consequently, good reason to suppose that the nerve acts upon the fibre through the medium of an imponderable fluid, and the more so, as it is proved that this action is not mechanical.

The medullary matter of the whole nervous system is homogeneous, and must be able to exercise its peculiar functions wherever it is found; all its ramifications are abundantly supplied with blood vessels.

All the animal fluids being drawn from the blood by secretion, we can have no doubt that such is the case with the nervous fluid, and that the medullary matter secretes it.

On the other hand, it is certain that the medullary matter is the sole conductor of the nervous fluid; all the other organic elements restrain and arrest it, as glass arrests electricity.

The external causes which are capable of producing sensations or causing contractions of the fibre are all chemical

agents, capable of effecting decompositions, such as light, caloric, the salts, odorous vapours, percussion, compression, &c. &c.

It would appear then that these causes act on the nervous fluid chemically, and by changing its composition; this appears the more likely, as their action becomes weakened by continuance, as if the nervous fluid needed the resumption of its primitive composition, to fit it for a fresh alteration.

The external organs of the senses may be compared to sieves, which allow nothing to pass through to the nerve, except that species of agent which should affect it in that particular place, but which often accumulates it so as to increase its effect. The tongue has its spongy papillæ which imbibe saline solutions; the ear, a gelatinous pulp which is violently agitated by sonorous vibrations; the eye, transparent lenses which concentrate the rays of light, &c. &c.

It is probable, that what are styled irritants, or the agents which occasion the contractions of the fibre, exert this action by producing on the fibre, by the nerve, a similar effect to that produced on it by the will; that is, by altering the nervous fluid, in the way that is requisite to change the dimensions of the fibre which it influences: but with this process the will has nothing to do, and very often the ME is entirely ignorant of it. The muscles separated from the body preserve their susceptibility of irritation, as long as the portion of the nerve that remains with them preserves the power of acting on them—with this phenomenon the will has evidently no connexion.

The nervous fluid is altered by muscular irritation, as well as by sensibility and voluntary motion, and the same necessity exists for the re-establishment of its primitive composition.

The transmutations necessary to vegetable life are occasioned by irritants; the aliment irritates the intestine, the blood irritates the heart, &c. These movements are all independent of the will, and generally (while in health) take place without the knowledge of the ME; in several parts, the nerves that produce them are even differently arranged from those that are appropriated to sensation or dependent on the will, and

the very object of this difference appears to be the securing of this independence.

The nervous functions, that is, sensibility and muscular irritability, are so much the stronger at every point, in proportion as their exciting cause is abundant; and as this cause or the nervous fluid is produced by secretion, its abundance must be in proportion to the quantity of medullary or secretory matter, and the amount of blood received by the latter.

In animals that have a circulating system, the blood is propelled through the arteries which convey it to its destined parts, by means of their irritability and that of the heart. If these arteries be irritated, they act more strongly, and propel a greater quantity of blood; the nervous fluid becomes more abundant and augments the local sensibility; this, in its turn, augments the irritability of the arteries, so that this mutual action may sometimes be carried to a great extent. It is called *orgasm*, and when it becomes painful and permanent, *inflammation*. The irritation may also originate in the nerve when exposed to the influence of acute sensations.

This mutual influence of the nerves and fibres, either intestinal or arterial, is the real spring of vegetative life in animals.

As each external sense is permeable only by such or such sensible substances, so each internal organ may be accessible only to this or that agent of irritation. Thus, mercury irritates the salivary glands, cantharides irritate the bladder, &c. These agents are called *specifics*.

The nervous system being homogeneous and continuous, local sensations and irritation debilitate the whole, and each function, by excessive action, may weaken the others. Excess of aliment weakens the power of thought, while long continued meditation impairs that of digestion, &c.

Excessive local irritation will enfeeble the whole body, as if all the powers of life were concentrated in one single point.

A second irritation produced at another part may diminish, or divert, as it is termed, the first: such is the effect of blisters, purgatives, &c.

Brief as our sketch has been, it is sufficient to establish the

possibility of accounting for all the phenomena of physical life, from the properties it presents, by the simple admission of a fluid such as we have defined.

Summary idea of the Functions and Organs of the Bodies of Animals, and of their various degrees of Complication.

After what we have stated respecting the organic elements of the body, its chemical principles and acting powers, nothing remains but to give a summary idea of the functions of which life is composed, and of their appropriate organs.

The functions of the animal body are divided into two classes:

The animal functions, or those proper to animals, that is to say, sensibility and voluntary motion.

The vital, vegetative functions, or those common to animals and vegetables, i. e., nutrition and generation.

Sensibility resides in the nervous system.

The most general external sense is that of touch; it is seated in the skin, a membrane that envelopes the whole body, which is traversed in every direction by nerves whose extreme filaments expand on the surface into papillæ, and are protected by the epidermis and other insensible teguments, such as hairs, scales, &c. &c. Taste and smell are merely delicate states of the sense of touch, for which the skin of the mouth and nostrils is particularly organized: the first, by means of papillæ more convex and spongy; the second, by its extreme delicacy and the multiplication of its ever humid surface. We have already spoken of the ear and the eye. The organ of generation is endowed with a sixth sense, seated in its internal skin; that of the stomach and intestines declares the state of those viscera by peculiar sensations. In fine, sensations more or less painful may originate in every part of the body through accident or disease.

Many animals have neither ears nor nostrils, several are without eyes, and some are reduced to the single sense of touch, which is never absent.

The action received by the external organs is continued by the nerves to the central masses of the nervous system, which, in the higher animals, consists of the brain and spinal marrow. The more elevated the nature of the animal, the more voluminous is the brain and the more is the sensitive power concentrated there; the lower the animal, the more the medullary masses are dispersed, and in the most imperfect genera, the entire nervous substance seems to melt into the general matter of the body.

That part of the body which contains the brain and principal organs of sense, is called the head.

When the animal has received a sensation, and this has occasioned volition; it is by the nerves, also, that this volition is transmitted to the muscles.

The muscles are bundles of fleshy fibres whose contractions produce all the movements of the animal body. The extension of the limbs and every elongation, as well as every flexion and abbreviation of parts, are the effects of muscular contraction. The muscles of every animal are arranged, both as respects number and direction, according to the movements it has to make; and when these motions require force, the muscles are inserted into hard parts, articulated one over another, and may be considered as so many levers. These parts are called bones in the vertebrated animals, where they are internal, and are formed of a gelatinous mass, penetrated by particles of phosphate of lime. In the Mollusca, the Crustacea, and Insects, where they are external, and composed of a calcareous or horny substance that exudes between the skin and epidermis, they are called shells, crusts and scales.

The fleshy fibres are attached to the hard parts by means of other fibres of a gelatinous nature, which seem to be a continuation of the former, constituting what are called tendons.

The configuration of the articulating surfaces of the hard parts limits their motion, which are also restrained by cords or envelopes, attached to the sides of the articulations, called ligaments.

It is from the various arrangements of this bony and muscular apparatus, and the form and proportion of the members

therefrom resulting, that animals are capable of executing the innumerable movements that enter into walking and leaping, flight and natation.

The muscular fibres, appropriated to digestion and the circulation, are independent of the will; they receive nerves, however, but the chief of them are subdivided and arranged in a manner which seems to have for its object their independence of the ME. It is only in paroxysms of the passions and other powerful affections of the soul, which break down these barriers, that the empire of the ME is perceptible, and even then it is almost always to disorder these vegetative functions. It is, also, in a state of sickness only that these functions are accompanied with sensations: digestion is usually performed unconsciously.

The aliment divided by the jaws and teeth, or sucked up when liquids constitute the food, is swallowed by the muscular movements of the hinder parts of the mouth and throat, and deposited in the first portions of the alimentary canal that is usually expanded into one or more stomachs; there it is penetrated with juices fitted to dissolve it. Passing thence through the rest of the canal, it receives other juices destined to complete its preparation. The parietes of the canal are pierced with pores which extract from this alimentary mass its nutritious portion; the useless residuum is rejected as excrement.

The canal in which this first act of nutrition is performed, is a continuation of the skin, and is composed of similar layers; even the fibres that encircle it are analogous to those which adhere to the internal surface of the skin, called the fleshy pannicle. Throughout the whole interior of this canal there is a transudation which has some connexion with the cutaneous perspiration, and which becomes more abundant when the latter is suppressed; the absorption of the skin is even very analogous to that of the intestines. It is in the lowest order of animals that the excrements are rejected by the mouth, their intestines resembling a sac, with but the one opening.

Even among those where the intestinal canal has two ori-

fices, there are many in which the nutritive juices being absorbed by the parietes of the intestine, are immediately diffused throughout the whole spongy substance of the body: such, it would appear, is the case with all Insects. But from the Arachnoides and Worms upwards, the nutritive fluid circulates in a system of closed vessels, whose ultimate ramifications alone dispense its molecules to the parts that are nourished by it; the vessels that convey it are called *arteries*, those that bring it back to the centre of the circulation, *veins*. The circulating vortex is here simple, and there double and even triple (including that of the vena portæ); the rapidity of its motion is often assisted by the contractions of a certain fleshy apparatus called a *heart*, which is placed at one or the other centres of circulation, and sometimes at both of them.

In the red-blooded vertebrated animals, the nutritive fluid exudes from the intestines, white or transparent, and is then termed *chyle;* it is poured into the veins where it mingles with the blood, by two peculiar vessels called *lacteals*. Vessels similar to these lacteals, and forming with them an arrangement called the lymphatic system, also convey to the venous blood the residue of the nutrition of the parts and the products of cutaneous absorption.

Before the blood is fit to nourish the parts, it must experience from the circumambient element the modification of which we have previously spoken. In animals possessing a circulating system, one portion of the vessels is destined to carry the blood into organs in which they spread it over a great surface to obtain an increase of this elemental influence. When that element is air, the surface is hollow, and is called *lungs;* when it is water, it is salient, and is termed *branchiæ*. There is always an arrangement of the organs of motion for the purpose of propelling the element into, or upon, the organ of respiration.

In animals destitute of a circulating system, air is diffused through every part of the body by elastic vessels called *tracheæ;* or water acts upon them, either by penetrating through vessels, or by simply bathing the surface of the skin. The respired, or purified blood is properly qualified for restoring

the composition of all the parts, and to effect what is properly called nutrition. This facility, which the blood possesses, of decomposing itself at every point, so as to leave there the precise kind of molecule necessary, is indeed wonderful; but it is this wonder which constitutes the whole vegetative life. For the nourishment of the solids we see no other arrangement than a great subdivision of the extreme arterial ramifications, but for the production of fluids the apparatus is more complex and various. Sometimes the extremities of the vessels simply spread themselves over large surfaces, whence the produced fluid exhales; at others it oozes from the bottom of little cavities. Before these arterial extremities change into veins, they most commonly give rise to particular vessels that convey this fluid, which appears to proceed from the exact point of union between the two kinds of vessels; in this case the blood vessels and these latter form, by interlacing, particular bodies called *conglomerate* or *secretory glands*.

In animals that have no circulation, in Insects particularly, the parts are all bathed in the nutritive fluid: each of these parts draws from it what it requires, and if the production of a liquid be necessary, proper vessels floating in the fluid take up by their pores the constituent elements of that liquid.

It is thus that the blood incessantly supports the composition of all the parts, and repairs the injuries arising from those changes which are the continual and necessary consequences of their functions. The general ideas we form with respect to this process are tolerably clear, although we have no distinct or detailed notion of what passes at each point, and for want of knowing the chemical composition of each part with sufficient precision, we cannot render an exact account of the transmutations necessary to effect it.

Besides the glands which separate from the blood those fluids that are destined for the internal economy, there are some which detach others from it that are to be totally ejected, either as superfluous—the urine, for instance, which is produced by the kidneys; or for some use to the animal, as the ink of the cuttle-fish, and the purple matter of various mollusca, &c.

With respect to generation, there is a process or phenomenon, infinitely more difficult to comprehend than that of the secretions—the production of the germ. We have even seen that it is to be considered as almost incomprehensible; but the existence of the germ being admitted, generation presents no particular difficulties. As long as it adheres to the parent, it is nourished as if it were one of its organs, and when it detaches itself, it possesses its own life, which is essentially similar to that of the adult.

The germ, the embryo, the fœtus, and the new-born animal have never, however, exactly the same form as the adult, and the difference is sometimes so great, that their assimilation has been termed a *metamorphosis*. Thus, no one not previously aware of the fact would suppose that the caterpillar is to become a butterfly.

Every living being is more or less metamorphosed in the course of its growth; that is, it loses certain parts, and developes others. The antennæ, wings, and all the parts of the butterfly were enclosed beneath the skin of the caterpillar; this skin vanishes along with the jaws, feet, and other organs, that do not remain with the butterfly. The feet of the frog are enclosed by the skin of the tadpole; and the tadpole, to become a frog, parts with its tail, mouth, and branchiæ. The child, at birth, loses its placenta and membranes; at a certain period its thymus gland nearly disappears, and it gradually acquires hair, teeth, and beard; the relative size of its organs is altered, and its body augments in a greater ratio than its head, the head more than the internal ear, &c.

The place where these germs are found, and their germs themselves are collectively styled the *ovary;* the canal through which, when detached, they are carried into the uterus, the *oviduct;* the cavity in which, in many species, they are compelled to remain for a longer or shorter period previous to birth, the *uterus;* and the external orifice through which they pass into the world, the *vulva*. Where there are sexes, the male impregnates, the germs appearing in the female. The fecundating liquor is called *semen;* the glands that separate

it from the blood, *testes;* and when it is requisite it should be carried into the body of the female, the introductory organ is named a *penis.*

Of the Intellectual Functions of Animals.

The impression of external objects upon the ME, the production of a sensation or of an image, is a mystery into which the human understanding cannot penetrate; and materialism an hypothesis, so much the more conjectual, as philosophy can furnish no direct proof of the actual existence of matter. The naturalist, however, should examine what appear to be the material conditions of sensation, trace the ulterior operations of the mind, ascertain to what point they reach in each being, and assure himself whether they are not subject to conditions of perfection, dependent on the organization of each species, or on the momentary state of each individual body.

To enable the ME to perceive, there must be an uninterrupted communication between the external sense and the central masses of the medullary system. It is then the modification only experienced by these masses that the ME perceives: there may also be real sensations, without the external organ being affected, and which originate either in the nervous chain of communication, or in the central mass itself; such are dreams and visions, or certain accidental sensations.

By central masses, we mean a part of the nervous system, that is so much the more circumscribed, as the animal is more perfect. In man, it consists exclusively of a limited portion of the brain; but in reptiles, it includes the brain and the whole of the medulla, and of each of their parts taken separately, so that the absence of the entire brain does not prevent sensation. In the inferior classes this extension is still greater.

The perception acquired by the ME, produces the image of the sensation experienced. We trace to without the cause of that sensation, and thus acquire the *idea* of the object that has produced it. By a necessary law of our intelligence, all ideas of material objects are in time and space.

The modifications experienced by the medullary masses leave impressions there which are reproduced, and thus reveal to the mind images and ideas; this is *memory*, a corporeal faculty that varies greatly, according to the age and health of the animal.

Similar ideas, or such as have been acquired at the same time, recal each other; this is the *association of ideas.* The order, extent and quickness of this association constitute the perfection of memory.

Every object presents itself to the memory with all its qualities or with all its accessary ideas.

Intelligence has the power of separating these accessary ideas of objects, and of combining those that are alike in several different objects under a *general idea;* the object of which no where really exists, nor presents itself per se—this is *abstraction.*

Every sensation being more or less agreeable or disagreeable, experience and repeated essays soon show what movements are required to procure the one and avoid the other; and with respect to this, the intelligence abstracts itself from the general rules to direct the *will.*

An agreeable sensation being liable to consequences that are not so, and vice versa, the subsequent sensations become associated with the idea of the primitive one, and modify the general rules framed by intelligence—this is *prudence.*

From the application of these rules to general ideas, result certain formulæ, which are afterwards easily adapted to particular cases—this is called *reasoning.*

A lively remembrance of primitive and associated sensations, and of the impressions of pleasure or pain that belong to them, constitutes *imagination.*

One privileged being, MAN, has the faculty of associating his general ideas with particular images more or less arbitrary, easily impressed upon the memory, and which serve to recal the general ideas they represent. These associated images are styled *signs;* their assemblage is a language. When the language is composed of images that relate to the sense of hearing or of *sounds*, it is termed *speech*, and when relative

to that of sight, *hieroglyphics*. *Writing* is a suite of images that relates to the sense of sight, by which we represent the elementary sounds; and by combining them, all the images relative to the sense of hearing of which speech is composed: it is therefore only a mediate representation of ideas.

This faculty of representing general ideas by particular signs or images associated with them, enables us to retain distinctly, and to remember without embarrassment, an immense number; and furnishes to the reasoning faculty and the imagination innumerable materials, and to individuals means of communication, which cause the whole species to participate in the experience of each individual, so that no bounds seem to be placed to the acquisition of knowledge: it is the distinguishing character of human intelligence.

Although, with respect to the intellectual faculties, the most perfect animals are infinitely beneath man; it is certain that their intelligence performs operations of the same kind. They move in consequence of sensations received, are susceptible of durable affections, and acquire by experience a certain knowledge of things, by which they are governed independently of actual pain or pleasure, and by the simple foresight of consequences. When domesticated, they feel their subordination, know that the being who punishes them may refrain from so doing if he will, and when sensible of having done wrong, or behold him angry, they assume a suppliant and deprecating air. In the society of man they become either corrupted or improved, and are susceptible of emulation and jealousy: they have among themselves a natural language, which, it is true, is merely the expression of their momentary sensations, but man teaches them to understand another, much more complicated, by which he makes known to them his will, and causes them to execute it.

To sum up all, we perceive in the higher animals a certain degree of reason, with all its consequences, good and bad, and which appears to be about the same as that of children ere they have learned to speak. The lower we descend from man the weaker these faculties become, and at the bottom of the scale we find them reduced to signs (at times equivocal) of sensibi-

lity, that is, to some few slight movements to escape from pain. Between these two extremes, the degrees are infinite.

In a great number of animals, however, there exists another kind of intelligence, called *instinct*. This induces them to certain actions necessary to the preservation of the species, but very often altogether foreign to the apparent wants of the individual; often also very complicated, and which, if attributed to intelligence, would suppose a foresight and knowledge in the species that perform them infinitely superior to what can possibly be granted. These actions, the result of instinct, are not the effect of imitation, for very frequently the individuals who execute them have never seen them performed by others: they are not proportioned to ordinary intelligence, but become more singular, more wise, more disinterested, in proportion as the animals belong to less elevated classes, and in all the rest of their actions are more dull and stupid. They are so entirely the property of the species, that all its individuals perform them in the same way without ever improving them a particle.

The working bees, for instance, have always constructed very ingenious edifices, agreeably to the rules of the highest geometry, and destined to lodge and nourish a posterity not even their own. The solitary bee, and the wasp also, form highly complicated nests, in which to deposit their eggs. From this egg comes a worm, which has never seen its parent, which is ignorant of the structure of the prison in which it is confined, but which, once metamorphosed, constructs another precisely similar.

The only method of obtaining a clear idea of instinct, is by admitting the existence of innate and perpetual images or sensations in the sensorium which cause the animal to act in the same way as ordinary or accidental sensations usually do. It is a kind of perpetual vision or dream that always pursues it, and it may be considered, in all that has relation to its instinct, as a kind of somnambulism.

Instinct has been granted to animals as a supplement to intelligence, to concur with it, and with strength and fecundity, in the preservation, to a proper degree, of each species.

There is no visible mark of instinct in the conformation of the animal, but, as well as it can be ascertained, the intelligence is always in proportion to the relative size of the brain, and particularly of its hemispheres.

Of Method, as applied to the Animal Kingdom.

From what has been stated with respect to methods in general, we have now to ascertain what are the essential characters in animals, on which their primary divisions are to be founded. It is evident they should be those which are drawn from the animal functions, that is from the sensations, and motions; for both these not only make the being an animal, but in a manner establish its degree of animality.

Observation confirms this position by showing that their degrees of development and complication accord with those of the organs of the vegetative functions.

The heart and the organs of the circulation form a kind of centre for the vegetative functions, as the brain and the trunk of the nervous system do for the animal ones. Now we see these two systems become imperfect and disappear together. In the lowest class of animals, where the nerves cease to be visible, the fibres are no longer distinct, and the organs of digestion are simple excavations in the homogeneous mass of the body. In insects the vascular system even disappears before the nervous one; but, in general, the dispersion of the medullary masses accompanies that of the muscular agents: a spinal marrow, on which the knots or ganglions represent so many brains, corresponds to a body divided into numerous rings, supported by pairs of limbs longitudinally distributed, &c.

This correspondence of general forms, which results from the arrangement of the organs of motion, the distribution of the nervous masses, and the energy of the circulating system, should then be the basis of the primary divisions of the animal kingdom. We will afterwards ascertain, in each of these divisions, what characters should succeed immediately to those, and form the basis of the primary subdivisions.

General distribution of the Animal Kingdom into Four Great Divisions.

If, divesting ourselves of the prejudices founded on the divisions formerly admitted, we consider only the organization and nature of animals, without regard to their size, utility, the greater or less knowledge we have of them, and other accessary circumstances, we shall find there are four principal forms, four general plans, if it may be so expressed, on which all animals seem to have been modelled, and whose ulterior divisions, whatever be the titles with which naturalists have decorated them, are merely slight modifications, founded on the development or addition of certain parts, which produce no essential change in the plan itself.

In the first of these forms, which is that of man, and of the animals most nearly resembling him, the brain and principal trunk of the nervous system are enclosed in a bony envelope, formed by the cranium and vertebræ; to the sides of this intermedial column are attached the ribs, and bones of the limbs, which form the frame work of the body; the muscles generally cover the bones, whose motions they occasion, while the viscera are contained within the head and trunk. Animals of this form we shall denominate

Animalia Vertebrata.

They have, all, red blood, a muscular heart, a mouth furnished with two jaws situated either above or before each other, distinct organs of sight, hearing, smell and taste placed in the cavities of the face, never more than four limbs, the sexes always separated, and a very similar distribution of the medullary masses and the principal branches of the nervous system.

By a closer examination of each of the parts of this great series of animals, we always discover some analogy, even in species the most remote from each other; and may trace the gradations of one same plan from man to the last of the fishes.

In the second form there is no skeleton; the muscles are

merely attached to the skin, which constitutes a soft contractile envelope, in which, in many species, are formed stony plates, called shells, whose position and production are analogous to those of the mucous body. The nervous system is contained within this general envelope along with the viscera, and is composed of several scattered masses connected by nervous filaments; the chief of these masses is placed on the œsophagus, and is called the brain. Of the four senses, the organs of two only are observable, those of taste and sight, the latter of which are even frequently wanting. One single family alone presents organs of hearing. There is always, however, a complete system of circulation, and particular organs for respiration. Those of digestion and secretion are nearly as complex as in the vertebrata. We will distinguish the animals of this second form by the appellation of

Animalia Mollusca.

Although, as respects the external configuration of the parts, the general plan of their organization is not as uniform as that of the vertebrata; there is always an equal degree of resemblance between them in the structure and the functions.

The third form is that remarked in worms, insects, &c. Their nervous system consists of two long cords, running longitudinally through the abdomen, dilated at intervals into knots or ganglions. The first of these knots, placed over the œsophagus, and called brain, is scarcely any larger than those that are along the abdomen, with which they communicate by filaments that encircle the œsophagus like a necklace. The covering or envelope of the body is divided by transverse folds into a certain number of rings, whose teguments are sometimes soft, and sometimes hard; the muscles, however, being always situated internally. Articulated limbs are frequently attached to the trunk; but very often there are none. We will call these animals

Animalia Articulata,

Or articulated animals, in which is observed the transition

from the circulation in closed vessels to nutrition by imbibition, and the corresponding one of respiration in circumscribed organs, to that effected by tracheæ or air-vessels distributed throughout the body. In them, the organs of taste and sight are the most distinct; one single family alone presenting that of hearing. Their jaws, when they have any, are always lateral.

The fourth form, which embraces all those animals known by the name of zoophytes, may also properly be denominated

Animalia Radiata,

Or radiated animals. We have seen that the organs of sense and motion in all the preceding ones are symmetrically arranged on the two sides of an axis. There is a posterior and anterior dissimilar face. In this last division, they are disposed like rays round a centre; and this is the case even when they consist of but two series, for then the two faces are similar. They approximate to the homogeneity of plants, having no very distinct nervous system or particular organs of sense; in some of them, it is even difficult to discover a vestige of circulation; their respiratory organs are almost universally seated on the surface of the body, the intestine in the greater number is a mere sac without issue, and the lowest of the series are nothing but a sort of homogeneous pulp, endowed with motion and sensibility.(1)

(1) Before my time, modern naturalists divided all invertebrated animals into two classes, Insects and Worms. I was the first who attacked this method; and in a memoir read before the Society of Natural History of Paris on the 10th of May 1795, and printed in the Decade Philosophique, I presented a new division, in which I marked the characters and limits of the Mollusca, Crustacea, Insects and Worms, Echinodermata and Zoophytes. In a memoir read before the Institute on the 31st of December 1801, I ascertained the red-blooded worms or Annelides. And finally, in a memoir read before the Institute in July 1812, and printed in the Annales du Museum d'Histoire Naturelle, tome xix, I distributed these various classes in three divisions, each of which is analogous to a branch of the vertebrata.

FIRST GREAT DIVISION OF THE ANIMAL KINGDOM.

ANIMALIA VERTEBRATA.

The bodies and limbs of vertebrated animals being supported by a frame-work or skeleton composed of connected pieces that are movable upon each other, their motions are certain and vigorous. The solidity of this support enables them to attain considerable size, and it is among them that the largest animals are found.

The great concentration of the nervous system, and the volume of its central portions, give energy and stability to their sentiments, whence result superior intelligence and perfectibility.

Their body always consists of a head, trunk and members.

The head is formed by the cranium which contains the brain, and by the face which is composed of two jaws and of the receptacles of the senses.

The trunk is supported by the spine and the ribs.

The spine is formed of vertebræ, the first of which supports the head, that move upon each other, and are perforated by an annular opening, forming together a canal, in which is lodged that medullary production from which arise the nerves, called the spinal marrow.

The spine, most commonly, is continued into a tail, extending beyond the posterior members.

The ribs are a kind of semicircular hoops which protect

the sides of the cavity of the trunk, they are articulated at one extremity with the vertebræ, and most generally at the other with the sternum; sometimes, however, they do not encircle the trunk, and there are genera in which they are hardly visible.

There are never more than two pairs of members, but sometimes one or the other is wanting, or even both. Their forms vary according to the movements they have to execute. The superior members are converted into hands, feet, wings or fins, and the inferior into feet or fins.

The blood is always red, and appears to be so composed as to sustain a peculiar energy of sentiment and muscular strength, but in various degrees, corresponding to their quality of respiration: from which originates the subdivision of the vertebrata into four classes.

The external senses are always five in number, and reside in two eyes, two ears, two nostrils, the teguments of the tongue, and those of the body, generally. In some species, however, the eyes are obliterated.

The nerves reach the medulla through the foramina of the vertebræ or those of the cranium; they all seem to unite with this medulla, which, after crossing its filaments, spreads out to form the various lobes of which the brain is composed, and terminates in the two medullary arches called hemispheres, whose volume is in proportion to the extent of the intelligence.

There are always two jaws, the greatest motion is in the lower one, which rises and falls; the upper jaw is sometimes immovable. Both of these are almost always armed with teeth, excrescences of a peculiar nature, which in their chemical composition are very similar to that of bone, but which grow by layers and transudation; one whole class, however, that of birds, has the jaws invested with horn, and the genus Testudo, in the class of reptiles, is in the same case.

The intestinal canal traverses the body from the mouth to the anus, experiencing various enlargements and contractions, having appendages and receiving solvent fluids, one of which, the saliva, is discharged into the mouth. The others, which are poured into the intestine only, have various names: the

two principal ones are the juices of the gland called the pancreas, and bile, a product of another very large gland named the liver.

While the digested aliment is traversing its canal, that portion of it which is fitted for nutrition, called the chyle, is absorbed by particular vessels styled lacteals, and carried into the veins; the residue of the nourishment of the parts is also carried into the veins by vessels analogous to these lacteals, and forming with them one same system called the *lymphatic system*.

The blood which has served to nourish the parts, and which has just been renewed by the chyle and lymph, is returned to the heart by the veins—but this blood is obliged, either wholly or in part, to pass into the organ of respiration, in order to regain its arterial nature, previous to being again sent through the system by the arteries. In the three first classes this respiratory organ consists of lungs, that is, a collection of cells into which air penetrates. In fish only, and in some reptiles, while young, it consists of branchiæ or a series of laminæ, between which water passes.

In all the vertebrata, the blood which furnishes the liver with the materials of the bile is venous blood, which has circulated partly in the parietes of the intestines, and partly in a peculiar body called the *spleen*, and which, after being united in a trunk called the *vena porta*, is again subdivided at the liver.

All these animals have a particular secretion; the *urine*, which is produced in two large glands, attached to the sides of the spine of the back, called *kidneys*—the liquid they secrete is most commonly poured into a reservoir, named *bladder*.

The *sexes* are separate, and the female has always one or two ovaries, from which the eggs are detached at the instant of conception. The male fecundifies them with the seminal fluid, but the mode varies greatly. In most of the genera of the three first classes, it requires an intromission of the fluid; in some reptiles, and in most of the fishes, it takes place after the exit of the egg.

Subdivision of the Vertebrata into Four Classes.

We have just seen how far vertebrated animals resemble each other; they present, however, four great subdivisions or classes, characterised by the kind or power of their motions, which depend themselves on the quantity of their respiration, inasmuch as it is from this respiration that the muscular fibres derive the strength of their irritability.

The quantity of respiration depends upon two agents: the first is the relative amount of blood which is poured into the respiratory organ in a given instant of time; the second is the relative amount of oxygen which enters into the composition of the surrounding fluid. The quantity of the former depends upon the disposition of the organs of circulation and respiration.

The organs of the circulation may be double, so that all the blood which is brought back from the various parts of the body by the veins, is forced to circulate through the respiratory organ, previous to resuming its former course through the arteries; or they may be simple, so that a part only of the blood is obliged to pass through that organ, the remainder returning directly to the body.

The latter is the case with reptiles. The quantity of their respiration, and all their qualities which depend on it, vary with the amount of blood thrown into the lungs at each pulsation.

Fishes have a double circulation, but their organ of respiration is formed to execute its function through the medium of water; and their blood is only acted on by the portion of oxygen it contains, so that the quantity of their respiration is perhaps less than that of reptiles.

In the mammalia the circulation is double, and the aerial respiration simple, that is, it is performed in the lungs only; their quantity of respiration is, consequently, superior to that of reptiles, on account of the form of their respiratory organ, and to that of fishes from the nature of their surrounding element.

The quantity of respiration in birds is even superior to that of quadrupeds, not only because they have a double circulation and an aerial respiration, but also because they respire by many other cavities besides the lungs, the air penetrating throughout their bodies, and bathing the branches of the aorta, as well as those of the pulmonary artery.

Hence result the four different kinds of motion for which the four classes of vertebrated animals are more particularly designed: *quadrupeds*, in which the quantity of respiration is moderate, are generally formed to walk and run, both motions being characterized by precision and vigour; *birds*, which have more of it, possess the muscular strength and lightness requisite for flight; *reptiles*, where it is diminished, are condemned to creep, and many of them pass a portion of their lives in a kind of torpor; *fishes*, in fine, to execute their motions, require to be supported in a fluid whose specific gravity is nearly as great as their own.

All the circumstances of organization peculiar to each of these four classes, and those especially which regard motion and the external sensations, have a necessary relation with these essential characters.

The mammalia, however, have particular characters in their viviparous mode of generation, in the manner by which the fœtus is nourished in the uterus through the medium of the placenta, and in the mammæ by which they suckle their young.

The other classes, on the contrary, are oviparous, and if we compare them to the first, we shall find such numerous points of resemblance as announce a peculiar system of organization in the great general plan of the vertebrata.

CLASS I.

MAMMALIA.

The mammalia are placed at the head of the animal kingdom, not only because it is the class to which man himself belongs, but also because it is that which enjoys the most numerous faculties, the most delicate sensations, the most varied powers of motion, and in which all the different qualities seem combined in order to produce a more perfect degree of intelligence, the one most fertile in resources, most susceptible of perfection, and least the slave of instinct.

As their quantity of respiration is moderate, they are designed in general for walking on the earth, but with vigorous and continued steps. The forms of the articulations of their skeleton, are, consequently, strictly defined, which determines all their motions with the most rigorous precision.

Some of them, however, by means of limbs considerably elongated, and extended membranes, raise themselves in the air; others have them so shortened, that they can move with facility in water only, though this does not deprive them of the general characters of the class.

The upper jaw, in all of these animals, is fixed to the cranium; the lower is formed of two pieces only, articulated by a projecting condyle to a fixed temporal bone; the neck consists of seven vertebræ, one single species excepted which has nine; the anterior ribs are attached before, by cartilage, to a sternum consisting of several vertical pieces; their anterior extremity commences in a shoulder-blade, that is not articulated, but simply suspended in the flesh, often resting on the sternum by means of an intermediate bone, called a clavicle.

This extremity is continued by an arm, a fore-arm, and a hand, the latter being composed of two ranges of small bones called the carpus, of another range called the metacarpus, and of the fingers, each of which consists of two or three bones, termed phalanges.

With the exception of the cetacea, the first part of the posterior extremity, in all animals of this class, is fixed to the spine, forming a girdle or pelvis, which, in youth, consists of three pairs of bones, the ilium which is attached to the spine, the pubis which forms the anterior part of the girdle, and the ischium, the posterior. At the point of union of these three bones is situated the cavity with which the thigh is articulated, to which, in its turn, is attached the leg, formed of two bones, the tibia and fibula; this extremity is terminated by parts similar to those of the hand, i. e. by a tarsus, metatarsus and toes.

The head of the mammalia is always articulated by two condyles, with the atlas, the first vertebra of the neck.

The brain is always composed of two hemispheres, united by a medullary layer, called the *corpus callosum*, containing the ventricles, and enveloping four pairs of tubercles, named the *corpora striata*, or striated bodies, the *thalami nervorum opticorum*, or beds of the optic nerves, and the *nates* and *testes*. Between the optic beds is a third ventricle, which communicates with a fourth under the *cerebellum*, the crura of which always form a transverse prominence under the *medulla oblongata*, called the *pons Varolii*, or bridge of Varolius.

The eye, invariably lodged in its orbit, is protected by two lids and a vestige of a third, and has its crystalline fixed by the ciliary processes—its sclerotic is simply cellular.

The ear always contains a cavity called the *tympanum*, or drum, which communicates with the mouth by the *Eustachian tube;* the cavity itself is closed externally by a membrane called the *membrana tympani*, and contains a chain of four little bones, named the *incus* or anvil, *malleus* or hammer, the *os orbiculare* or circular bone, and the *stapes* or stirrup; a vestibule, on the entrance of which rests the stapes, and which communicates with three semicircular canals; and, finally, a

cochlea, which terminates by one canal in the vestibule, and by the other in the tympanum.

Their cranium is subdivided into three portions; the anterior is formed by the two frontal and ethmoidal bones, the middle by the two ossa parietalia and the os ethmoides, and the posterior by the os occipitis. Between the ossa parietalia, the sphenoidalis and the os occipitis, are interposed the two temporal bones, part of which belong properly to the face.

In the fœtus, the occipital bone is divided into four parts: the sphenoidal into two halves, which are again subdivided into three pairs of lateral wings; the temporal into three, one of which serves to complete the cranium, the second to close the labyrinth of the ear, the third to form the parietes of the tympanum, &c. These bony portions, still more numerous in the earliest period of the fœtal existence, are united more or less promptly, according to the species, and the bones themselves finally become consolidated in the adult.

Their face consists of the two maxillary bones, between which pass the nostrils; the two intermaxillaries are situated before, and the two ossa palati behind them; between these descends the vomer, a bony process of the os ethmoides; at the entrance of the nasal canal are placed the ossa nasi; to its external parietes adhere the inferior turbinated bones, the superior ones which occupy its upper and posterior portion belonging to the os ethmoides. The jugal or cheek bone unites the maxillary to the temporal bone on each side, and frequently to the os frontis; finally, the os unguis, and pars plana of the ethmoid bone occupy the internal angle of the orbit, and sometimes a part of the cheek. In the embryo state these bones also are much more subdivided.

Their tongue is always fleshy, connected with a bone called the hyoides, which is composed of several pieces, and suspended from the cranium by ligaments.

Their lungs, two in number, divided into lobes, and composed of an infinitude of cells, are always enclosed, without any adhesion, in a cavity formed by the ribs and diaphragm and lined by the pleura; the organ of voice is always at the

upper extremity of the trachea; a fleshy curtain, called the *velum palati*, establishes a direct communication between their larynx and nasal canal.

Their residence on the surface of the earth rendering them less exposed to the alternations of cold and heat, their tegument, the hair, is but moderately thick, and in such as inhabit warm climates, even that is rare.

The Cetacea, which live exclusively in water, are the only ones that are altogether deprived of it.

The abdominal cavity is lined with a membrane called the *peritoneum*, and the intestinal canal is suspended to a fold of it called the *mesentery*, which contains numerous conglobate glands in which the lacteals ramify: another production of the peritoneum, styled the *epiploon*, hangs in front of and under the intestines.

The urine which is retained for a time in the bladder finds an exit in both sexes, with very few exceptions, by orifices in the organs of generation.

In all the Mammalia, generation is essentially viviparous; that is, the fœtus, directly after conception, descends into the uterus enveloped in its membranes, the exterior of which is called *chorion* and the interior *amnios;* it fixes itself to the parietes of this cavity by one plexus, or more of vessels called the placenta, which establishes a communication between it and the mother, by which it receives its nourishment, and most probably its oxygenation, notwithstanding which, the fœtus of the Mammalia, at an early period, has a vesicle analogous to that which contains the yolk in the Ovipara, receiving in like manner vessels from the mesentery. It has also another external bladder named the *allantoid*, which communicates with the urinary one by a canal called the *urachus*.

Conception always requires an effectual coitus, in which the semen masculinum is thrown into the uterus of the female.

The young are nourished for some time after birth by a fluid (milk) peculiar to animals of this class, which is produced by the mammæ at the time of parturition, and continues to be so as long as is necessary. It is from the *mammæ* that

this class derives its name, and being a character peculiar to it, they distinguish it better than any other that is external.(1)

Division of the Mammalia into Orders.

The variable characters which form essential differences among the Mammalia are taken from the organs of touch, on which depends their degree of ability or address, and from the organs of manducation, which determine the nature of their aliment, and are all closely connected, not only with every thing relative to the function of digestion, but also with a multitude of other differences relating even to their intelligence.

The degree of perfection of the organs of touch is estimated by the number and the pliability of the fingers, and from the greater or less extent to which their extremities are enveloped by the nail or the hoof.

A hoof which completely envelopes the end of the toe, blunts its sensibility, and renders the foot incapable of seizing.

The opposite extreme is when a nail, formed of one single lamina, covers only one of the faces of the extremity of the finger, leaving the other possessed of all its delicacy.

The nature of the food is known by the grinders, to the form of which the articulation of the jaws universally corresponds.

To cut flesh, grinders are required as trenchant as a saw, and jaws fitted like scissars, having no other motion than a vertical one.

For bruising roots or grains, flat-crowned grinders are necessary, and jaws that have a lateral motion; in order that inequalities may always exist on the crown of these teeth, it is also requisite that their substance be composed of parts of unequal hardness, so that some may wear away faster than others.

Hoofed animals are all necessarily herbivorous, and have

(1) We shall find, however, in the sequel some doubts on this subject, arising from certain points in the family of the *Monotremata*.

flat-crowned grinders, inasmuch as their feet preclude the possibility of their seizing a living prey.

Animals with unguiculated fingers were susceptible of more variety; their food is of all kinds, and independently of the form of their grinders, they differ greatly from each other in the pliability and delicacy of their fingers. There is one character with respect to this, which has immense influence on their dexterity and greatly multiplies its powers; it is the faculty of opposing the thumb to the finger for the purpose of seizing minute objects, constituting what is properly called a *hand;* a faculty which is carried to its highest perfection in man, in whom the whole anterior extremity is free and capable of prehension.

These various combinations which strictly determine the nature of the different Mammalia, have given rise to the following orders:

Among the unguiculated animals, the first is *Man*, who, in addition to privileges of other descriptions, possesses hands at the anterior extremities only, the posterior being designed to support him in an erect position.

In the order next to man, that of the QUADRUMANA, we find hands at the four extremities.

In another order, that of the CARNARIA, the thumb is not free, and cannot be opposed to the anterior extremities.

Each of these orders has the three sorts of teeth, grinders, canini, and incisors or cutting teeth.

In a fourth order, that of the RODENTIA, the toes differ but little from those of the Carnaria, but there are no canine teeth, and the incisors are placed in front of the mouth, and adapted to a very peculiar sort of manducation.

Then come those animals whose toes are much cramped, and deeply sunk in large nails, which are generally curved; they have no incisors, and in some the canines disappear, while others have none of any description. We comprise them all under the title of the EDENTATA.

This distribution of the unguiculated animals would be perfect, and form a very regular series, were it not that New Holland has lately furnished us with a little collateral one,

consisting of *animals with pouches*, the different genera of which are connected by a general similarity of organization; some of them, however, in the teeth and nature of their diet corresponding to the Carnaria, others to the Rodentia, and a third to the Edentata.

The hoofed animals are less numerous, and have likewise fewer irregularities.

The RUMINANTIA, by their cloven foot, the absence of true incisors in their upper jaw, and their four stomachs, form an order that is very distinct.

The remaining hoofed animals may all be united in a single order, which I shall call PACHYDERMATA or JUMENTA, the *Elephant* excepted, which might constitute a separate one, and which is remotely connected with that of the Rodentia.

In the last place, we find those of the Mammalia which have no posterior extremities, whose piscatory form and aquatic mode of life would induce us to form them into a particular class, were it not that in every thing else their economy is similar to that in which we leave them. These are the hot-blooded fishes of the ancients, or the CETACEA, which, uniting to the vigour of the other mammalia the advantage of being sustained by the watery element, present to our wondering sight the most gigantic of animals.

ORDER I.

BIMANA.

Man forms but one genus, and that genus the only one of its order. As his history is the more directly interesting to ourselves, and forms the point of comparison to which we refer that of other animals, we will speak of it more in detail.

We will rapidly sketch every thing that is peculiar in each of his organic systems, amidst all that he shares in common with other mammalia; we will examine the advantages he

derives from these peculiarities over other species; we will describe the principal varieties of his race and their distinguishing characters, and finally point out the natural order in which his individual and social faculties are developed.

Peculiar Conformation of Man.

The foot of Man is very different from that of the Monkey; it is large; the leg bears vertically upon it; the heel is expanded beneath; the toes are short, and but slightly flexible; the great toe, longer and larger than the rest, is placed on the same line with, and cannot be opposed to them. This foot, then, is peculiarly well adapted to support the body; but cannot be used for seizing or climbing, and as the hands are not calculated for walking, Man is the only true bimanous and biped animal.

The whole body of Man is arranged with a view to a vertical position. His feet, as just mentioned, furnish him with a base more extensive than that of any other of the Mammalia. The muscles which extend the foot and thigh are more vigorous, whence proceeds the projection of the calf and buttock; the flexors of the leg are inserted higher up, which allows full extension of the knee, and renders the calf more apparent. The pelvis is wider, hence a greater separation of the thighs and feet, and that pyramidal form of the body so favourable to equilibrium. The necks of the thigh bones form an angle with the body of the bone, which increases, still more, the separation of the feet, and augments the basis of the body. Finally, the head in this vertical position is in equilibrium on the body, because its articulation is exactly under the middle of its mass.

Were he to desire it, Man could not, with convenience, walk on all fours; his short and nearly inflexible foot, and his long thigh, would bring the knee to the ground; his widely separated shoulders and his arms, too far extended from the median line, would ill support the upper portion of his body. The great indented muscle, which, in quadrupeds, suspends, as in a girth, the body between the scapulæ, is smaller in Man than in any one among them. The head is also heavier, both from the magnitude of the brain and the smallness of the *sinuses* or cavities of the bones; and yet the means of supporting it are weaker, for he has neither cervical ligament, nor are his vertebræ so arranged as to prevent their flexure forwards; the result of this would be, that he could only keep his head in the same line with the spine, and then his eyes and mouth being directed towards the earth, he could not see before him;—in the erect posi-

tion, on the contrary, the arrangement of these organs is every way perfect.

The arteries which are sent to his brain, not being subdivided as in many quadrupeds, and the blood requisite for so voluminous an organ being carried into it with too much violence, frequent apoplexies would be the consequence of a horizontal position.

Man, then, is formed for an erect position only. He thus preserves the entire use of his hands for the arts, while his organs of sense are most favourably situated for observation.

These hands, which derive such advantages from their liberty, receive as many more from their structure. The thumb, longer in proportion than that of the Monkey, increases its facility of seizing small objects. All the fingers, the annularis excepted, have separate movements, a faculty possessed by no other animal, not even by the Monkey. The nail, covering one side only of the extremity of the finger, acts as a support to the touch, without depriving it of an atom of its delicacy. The arms to which these hands are attached, are strongly and firmly connected by the large scapula, the strong clavicle, &c.

Man, so highly favoured as to dexterity, is not at all so with respect to force. His swiftness in running is greatly inferior to that of other animals of his size. Having neither projecting jaws, nor salient canine teeth, nor claws, he is destitute of offensive weapons; and the sides and upper parts of his body being naked, unprovided even with hair, he is absolutely without defensive ones. Of all animals, he is also the longest in attaining the power necessary to provide for himself.

This very weakness, however, is but one advantage more—it compels him to have recourse to that intelligence within, for which he is so eminently conspicuous.

No quadruped approaches him in the magnitude and convolutions of the hemispheres of the brain, that is, in the part of this organ which is the principal instrument of the intellectual operations. The posterior portion of the same organ extends backwards, so as to form a second covering to the cerebellum; the very form of his cranium announces this magnitude of the brain, while the smallness of his face shows how slightly that portion of the nervous system which influences the external senses predominates in him.

These external sensations, moderate as they all are in Man, are nevertheless extremely delicate and well balanced.

His two eyes are directed forwards; he does not see on two sides at once, like many quadrupeds, which produces more unity in the result of his sight, and concentrates his attention more closely on sensations of this kind. The ball and iris of his eye vary but little;

this restrains the activity of his sight to a limited distance, and a determined degree of light. His external ear, possessing but little mobility or extent, does not increase the intensity of sounds, and yet, of all animals, he best distinguishes the various degrees of intonation. His nostrils, more complicated than those of the Monkey, are less so than those of all other genera; and yet he appears to be the only animal whose sense of smell is sufficiently delicate to be affected by unpleasant odours. Delicacy of smell must have some influence on that of taste, and independently of this Man must have some advantage in this respect over other animals, those, at least, whose tongues are covered with scales. Lastly, the nicety of his tact results, both from the delicacy of his teguments, and the absence of all insensible parts, as well as from the form of his hand, which is better adapted than that of any other animal for suiting itself to every little superficial inequality.

Man is pre-eminently distinguished in the organ of his voice; of all the Mammalia, he alone possesses the faculty of articulating sounds, its probable causes being the form of his mouth and the great mobility of his lips. From this results his most invaluable mode of communication, for of all the signs which can be conveniently employed for the transmission of ideas, variations of sound are those which can be perceived at the greatest distance, and are the most extensive in their sphere of operation.

The whole of his structure, even to the heart and great vessels, appears to have been framed with a view to a vertical position. The heart is placed obliquely on the diaphragm, and its point inclines to the left, thereby occasioning a distribution of the aorta, differing from that of most quadrupeds.

The natural food of man, judging from his structure, appears to consist of the fruits, roots, and other succulent parts of vegetables: his hands offer him every facility for gathering them; his short, and but moderately strong jaws on the one hand, and his canini being equal in length to the remaining teeth, and his tubercular molares on the other, would allow him neither to feed on grass nor to devour flesh, were these aliments not previously prepared by cooking. Once, however, possessed of fire, and those arts by which he is aided in seizing animals or killing them at a distance, every living being was rendered subservient to his nourishment, thereby giving him the means of an infinite multiplication of his species.

His organs of digestion are in conformity with those of manducation; his stomach is simple, his intestinal canal of moderate length, the great intestines well marked, his cæcum short and thick and augmented by a small appendage, and his liver divided only into two

large lobes and one small one; his epiploon hangs in front of the intestines, and extends into the pelvis.

To complete the hasty sketch of the anatomical structure of Man requisite for this introduction, we will add, that he has thirty-two vertebræ, of which seven belong to the neck, twelve to the back, five to the loins, five to the sacrum, and three to the coccyx. Seven pairs of his ribs are united with the sternum by elongated cartilages, and are called true ribs; the five following pairs are denominated false ones. His adult cranium is formed of eight bones; an occipitalis, two ossa temporis, two parietalia, and the frontal, ethmoidal and sphenoidal bones. The bones of his face are fourteen in number, two maxillaries, two ossa malæ, each of which joins the temporal to the maxillary bone of its own side by a kind of handle called the zygomatic arch; two nasal bones, two ossa palati behind the palate, a vomer between the nostrils, two turbinated bones of the nose in the nostrils, two lachrymals (unguis) in the internal angles of the orbits and the single bone of the lower jaw. Each jaw has sixteen teeth; four cutting incisors in the middle, two pointed canines at the corners, and ten tuberculated molares, five on each side. At the extremity of the spine of his scapula, is a tuberosity called the acromion, to which the clavicle is attached, and over its articulation is a point called the coracoid process with which certain muscles are connected. The radius revolves upon the ulna, owing to the mode of its articulation with the humerus. The carpus has eight bones, four in each range; the tarsus has seven; those of the remaining parts of the hand and foot may be easily counted by the number of fingers and toes.

Enjoying uniform and regular supplies of nourishment, the fruit of his industry, Man is at all times inclined to the "plaisirs d'amour," without ever experiencing that irresistible and violent impetus which marks the passion in quadrupeds. His organ of generation is not upheld by a bony axis; the prepuce does not tie it down to the abdomen, and it hangs loosely in front of the pubis. Numerous and large veins which effect a rapid transfer of the blood of his testes to the general circulation, appear to contribute to the moderation of his desires.

The uterus of woman is a simple oval cavity; her mammæ, only two in number, are placed upon her breast, and correspond with the facility she possesses of supporting her child upon her arm.

Physical and Moral Development of Man.

The term of gestation in the human species is nine months, and but one child is usually produced at a birth, as in five hundred

cases of parturition there is but one of twins; more than the latter is extremely rare. The fœtus, a month old, is generally about one inch in height; when two months, it is two inches and a half; when three, five inches; in the fifth month, it is six or seven inches; in the seventh, it is eleven inches; in the eighth, fourteen, and in the ninth, eighteen inches. Those which are born prior to the seventh month usually die. The first or milk teeth begin to appear in a few months, commencing with the incisors. The number increases in two years to twenty, which, about the seventh year, are successively shed to make room for others. Of the twelve posterior molares which are permanent, there are four which make their appearance at four years and a half, and four at nine; the last four are frequently not cut until the twentieth year. The growth of the fœtus is proportionably increased as it approaches the time of birth—that of the child, on the contrary, is always less and less. It has more than the fourth of its height when born; it attains the half of it at two years and a half, and the three-fourths at nine or ten years; its growth is completed about the eighteenth year. Man rarely exceeds the height of six feet, and as rarely remains under five. Woman is usually some inches shorter.

Puberty is announced by external symptoms, from the tenth to the twelfth year in girls, and from the twelfth to the sixteenth in boys; it arrives sooner in warm climates, and neither sex, (very rarely at least,) is productive before or after that manifestation.

Scarcely has the body gained the full period of its growth in height, before it begins to increase in bulk; fat accumulates in the cellular tissue, the different vessels become gradually obstructed, the solids become rigid, and, after a life more or less long, more or less agitated, more or less painful, old age arrives with decrepitude, decay, and death. Man rarely lives beyond a hundred years, and most of the species, either from disease, accident, or old age, perish long before that term.

The child needs the assistance of its mother much longer than her milk, from this it obtains an education both moral and physical, and a mutual attachment is created that is fervent and durable. The nearly equal number of the two sexes, the difficulty of supporting more than one wife, when wealth does not supply the want of power, all go to prove that monogamy is the mode of union most natural to our species, and, as wherever this kind of tie exists, the father participates in the education of his offspring, the length of time required for that education allows the birth of others—hence the natural permanence of the conjugal state. From the long period of infantile weakness springs domestic subordination, and the order of society in general, as the young people which compose the new

families continue to preserve with their parents those tender relations to which they have so long been accustomed. This disposition to mutual assistance multiplies to an almost unlimited extent those advantages previously derived by insulated man from his intelligence; it has assisted him to tame or repulse other animals, to defend himself from the effects of climate, and thus enabled him to cover the earth with his species.

In other respects, man appears to possess nothing resembling instinct, no regular habit of industry produced by innate ideas; his knowledge is the result of his sensations and of his observation, or of those of his predecessors. Transmitted by speech, increased by meditation, and applied to his necessities and his enjoyments, they have originated all the arts of life. Language and letters, by preserving acquired knowledge, are a source of indefinite perfection to his species. It is thus he has acquired ideas, and made all nature contribute to his wants.

There are very different degrees of development, however, in man.

The first hordes, compelled to live by fishing and hunting, or on wild fruits, and being obliged to devote all their time to search for the means of subsistence, and not being able to multiply greatly, because that would have destroyed the game, advanced but slowly. Their arts were limited to the construction of huts and canoes, to covering themselves with skins and the fabrication of arrows and nets. They observed such stars only as directed them in their journeys, and some few natural objects whose properties were of use to them. They domesticated the Dog, simply because he had a natural inclination for their own kind of life. When they had succeeded in taming the herbivorous animals, they found in the possession of numerous flocks a never failing source of subsistence, and also some leisure, which they employed in extending the sphere of their acquirements. Some industry was then employed in the construction of dwellings and the making of clothes: the idea of property was admitted, and consequently that of barter, as well as wealth and difference of conditions, those fruitful sources of the noblest emulation and the vilest passions: but the necessity of searching for fresh pastures, and of obeying the changes of the seasons, still doomed them to a wandering life, and limited their improvement to a very narrow sphere.

The multiplication of the human species, and its improvement in the arts and sciences, have only been carried to a high degree since the invention of agriculture and the division of the soil into hereditary possessions. By means of agriculture, the manual labour of a portion of society is adequate to the maintenance of the whole, and allows the remainder time for less necessary occupations, at the same

time that the hope of acquiring, by industry, a comfortable existence for self and posterity, has given a new spring to emulation. The discovery of a representative of property or a circulating medium, by facilitating exchanges and rendering fortunes more independent and susceptible of being increased, has carried this emulation to its highest degree, but by a necessary consequence it has also equally increased the vices of effeminacy and the furies of ambition.

The natural propensity to reduce every thing to general principles, and to search for the causes of every phenomenon, has produced reflecting men, in every stage of society, who have added new ideas to those already obtained, nearly all of whom, while knowledge was confined to the few, endeavoured to convert their intellectual superiority into the means of domination, by exaggerating their own merit, and disguising the poverty of their knowledge by the propagation of superstitious ideas.

An evil still more irremediable, is the abuse of physical power: now that man only can injure man, he is continually seeking to do so, and is the only animal upon earth that is for ever at war with his own species. Savages fight for a forest, and herdsmen for a pasture, and as often as they can, break in upon the cultivators of the earth to rob them of the fruits of their long and painful labours. Even civilized nations, far from being contented with their blessings, pour out each other's blood for the prerogatives of pride, or the monopoly of trade. Hence, the necessity for governments to direct the national wars, and to repress or reduce to regular forms the quarrels of individuals.

The social condition of man has been restrained, or advanced by circumstances more or less favourable.

The glacial climates of the north of both continents, and the impenetrable forests of America are still inhabited by the savage hunter or fisherman. The immense sandy and salt plains of central Asia and Africa are covered with a pastoral people, and innumerable herds. These half civilized hordes assemble at the call of every enthusiastic chief, and rush like a torrent on the cultivated countries that surround them, in which they establish themselves, but to be weakened by luxury, and in their turn to become the prey of others. This is the true cause of that despotism which has always crushed and destroyed the industry of Persia, India, and China.

Mild climates, soils naturally irrigated and rich in vegetables, are the cradles of agriculture and civilization, and when so situated as to be sheltered from the incursions of barbarians, every species of talent is excited; such were (the first in Europe) Italy and Greece, and such is, at present, nearly all that happy portion of the earth.

There are, however, certain intrinsic causes which seem to arrest the progress of particular races, although situated amidst the most favourable circumstances.

Varieties of the Human Species.

Although the promiscuous intercourse of the human species, which produces individuals capable of propagation, would seem to demonstrate its unity, certain hereditary peculiarities of conformation are observed which constitute what are termed *races*.

Three of them in particular appear very distinct—the *Caucasian* or white, the *Mongolian* or yellow, and the *Ethiopian* or negro.

The Caucasian, to which we belong, is distinguished by the beauty of the oval formed by his head, varying in complexion and the colour of the hair. To this variety, the most highly civilized nations, and those which have generally held all others in subjection, are indebted for their origin.

The Mongolian is known by his high cheek bones, flat visage, narrow and oblique eyes, straight black hair, scanty beard and olive complexion. Great empires have been established by this race in China and Japan, and their conquests been extended to this side of the Great Desert. In civilization, however, it has always remained stationary.

The Negro race is confined to the south of mount Atlas; it is marked by a black complexion, crisped or woolly hair, compressed cranium, and a flat nose. The projection of the lower parts of the face, and the thick lips, evidently approximate it to the monkey tribe: the hordes of which it consists have always remained in the most complete state of utter barbarism.

The race from which we are descended has been called *Caucasian*, because tradition and the filiation of nations seem to refer its origin to that group of mountains situated between the Caspian and Black seas, whence, as from a centre, it has been extended like the radii of a circle. Various nations in the vicinity of Caucasus, the Georgians and Circassians, are still considered the handsomest on earth. The principal ramifications of this race may be distinguished by the analogies of language. The Armenian or Syrian branch, stretching to the south, produced the Assyrians, the Chaldeans, the hitherto untameable Arabs, who, after Mahomet, were near becoming masters of the world; the Phenicians, Jews and Abyssinians, which were Arabian colonies; and most probably the Egyptians. It is from this branch, always inclined to mysticism, that have sprung the most widely extended forms of religion—the arts and literature

have sometimes flourished among its nations, but always enveloped in a strange disguise and figurative style.

The Indian, German, and Pelasgic branch is much more extended, and was much earlier divided: notwithstanding which, the most numerous affinities may be observed between its four principal languages—the Sanscrit, the present sacred language of the Hindoos, and the parent of the greater number of the dialects of Hindostan; the ancient language of the Pelasgi, common mother of the Greek, Latin, many tongues that are extinct, and of all those of the south of Europe; the Gothic or Teutonic, from which are derived the languages of the north and north-west of Europe, such as the German, Dutch, English, Danish, Swedish, and other dialects; and finally, the Sclavonian, from which spring those of the north-east, the Russian, Polish, Bohemian, &c.

It is by this great and venerable branch of the Caucasian stock, that philosophy, the arts, and the sciences have been carried to the greatest perfection, and remained in the keeping of the nations which compose it for more than three thousand years.

It was preceded in Europe by the Celts, who came from the north, whose tribes, once very numerous, are now confined to its most eastern extremity, and by the Cantabrians, who passed from Africa into Spain, now confounded with the many nations whose posterity have intermingled in that peninsula.

The ancient Persians originate from the same source as the Indians, and their descendants to the present hour bear great marks of resemblance to the people of Europe.

The predatory tribes of the Scythian and Tartar branch, extending at first to the north and north-east, always wandering over the immense plains of those countries, returned only to devastate the happier abodes of their more civilized brethren. The Scythians, who, at so remote a period, made irruptions into upper Asia; the Parthians, who there destroyed the Greek and Roman domination; the Turks, who there subverted that of the Arabs, and subjugated in Europe the unfortunate remnant of the Grecian people, all swarmed from this prolific branch. The Finlanders and Hungarians are tribes of the same division, which have strayed among the Sclavonic and Teutonic nations. Their original country, to the north and north-east of the Caspian sea still contains inhabitants who have the same origin, and speak similar languages, but mingled with other petty nations, variously descended, and of different languages. The Tartars remained unmixed longer than the others in the country included between the mouth of the Danube to beyond the Irtisch, from which they so long menaced Russia, and where they have finally been subjugated by her. The Mongoles, however, have

mingled their blood with that of those they conquered, many traces of which may still be found among the inhabitants of lesser Tartary.

It is to the east of this Tartar branch of the Caucasian race that the Mongolian race begins, whence it extends to the eastern ocean. Its branches, the Calmucs, &c. still wandering shepherds, are constantly traversing the desert. Thrice did their ancestors under Attila, Genghis, and Tamerlane, spread far the terror of their name. The Chinese are the earliest and most civilized branch not only of this race, to which they belong, but of all the nations upon earth. A third branch, the Mantchures, recently conquered, and still govern China. The Japanese, Coreans, and nearly all the hordes which extend to the north-east of Siberia, subject to Russia, are also to be considered, in a great measure, as originating from this race; and such also is esteemed the fact, with regard to the original inhabitants of various islands of that Archipelago. With the exception of a few Chinese literati, the different nations of the Mongoles are universally addicted to Buddism, or the religion of Fo.

The origin of this great race appears to have been in the mountains of Atlai, but it is impossible to trace the filiation of its different branches with the same certainty as we have done those of the Caucasian. The history of these wandering nations is as fugitive as their establishments, and that of the Chinese, confined exclusively to their own empire, gives us nothing satisfactory with respect to their neighbours. The affinities of their languages are also too little known to direct us in this labyrinth.

The languages of the north of the Peninsula beyond the Ganges, as well as that of Thibet, are somewhat allied to the Chinese, at least in their monosyllabic structure, and the people who speak them have features somewhat resembling other Mongoles. The south of this Peninsula, however, is inhabited by Malays, whose forms approximate them much nearer to the Indians, whose race and language are extended over all the coasts of the islands of the Indian Archipelago. The innumerable little islands of the southern ocean are also peopled by a handsome race, nearly allied to the Indians, whose language is very similar to the Malay; in the interior of the largest of these islands, particularly in the wilder portions of it, is another race of men with black complexions, crisped hair, and negro faces, called Alfourous. On the coast of New Guinea, and in the neighbouring islands, we find other negroes, nearly similar to those of the eastern coast of Africa, named Papuas;(1) to the latter,

(1) With respect to the various nations of the Indian and Pacific oceans, see the dissertation of Messrs Lesson and Garnot in the Zoologie du Voyage de la

are generally referred the people of Van-Diemen's land, and those of New Holland to the Alfourous.

These Malays, and these Papuas are not easily referable to either of the three great races of which we have been speaking, but can the former be clearly distinguished from their neighbours, the Caucasian Hindoos and the Mongolian Chinese? As for us, we confess we cannot discover any sufficient characteristics in them for that purpose. Are the Papuas Negroes, which may formerly have strayed into the Indian ocean? We possess neither figures nor descriptions sufficiently precise to enable us to answer this question.

The northern inhabitants of both continents, the Samoiëdes, the Laplanders, and the Esquimaux spring, according to some, from the Mongolian race, while others assert that they are mere degenerate offsets from the Scythian and Tartar branch of the Caucasian stock.

We have not yet been able to refer the Americans to any of the races of the eastern continent; still, they have no precise nor constant character which can entitle them to be considered as a particular one. Their copper coloured complexion is not sufficient; their generally black hair and scanty beard would induce us to refer them to the Mongoles, if their defined features, projecting nose, large and open eye, did not oppose such a theory, and correspond with the features of the European. Their languages are as numberless as their tribes, and no demonstrative analogy has as yet been obtained, either with each other, or with those of the old world.(1)

ORDER II.

QUADRUMANA.

Independently of the anatomical details which distinguish it from man, and which have been given, this family differs from our species in a very remarkable way. All the animals belonging to it have the toes of the hind feet free and oppo-

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Coquille, p. 1—113. For the languages of the Asiatics and their affinities, consult the Asia Polyglotta of M. Klaproth.

(1) See the Voyage de M. de Humboldt, and the dissertations of Vater and Mitchill.

sable to the others, and the toes are all as long and flexible as fingers. In consequence of this, the whole species climb trees with the greatest facility, while it is only with pain and difficulty they can stand and walk upright; their foot then resting on its outer edge only, and their narrow pelvis being unfavourable to an equilibrium. They all have intestines very similar to those of man; the eyes directed forwards, the mammæ on the breast, the penis pendent. The brain has three lobes on each side, the posterior of which covers the cerebellum, and the temporal fossæ are separated from the orbits by a bony partition. In every thing else, however, they gradually lessen in resemblance to him, by assuming a muzzle more and more elongated, a tail and a gait more like that of quadrupeds. Notwithstanding this, the freedom of their arms and the complication of their hands allow them all to perform many of the actions of man as well as to imitate his gestures.

They have long been divided into two genera, the *Monkeys* and the *Lemurs*, which, by the multiplication of secondary forms, have now become two small families, between which we must place a third genus that of the *Ouistitis*, as it is not conveniently referable to the one or the other.

Simia. Lin.

The monkeys are all quadrumana, which have four straight incisors in each jaw, and flat nails on all the extremities; two characters which approximate them more nearly to man, than the subsequent genera; their molares have also blunt tubercles like ours, and their food consists chiefly of fruits. Their canine teeth, however, being longer than the rest, supply them with a weapon we do not possess, and which require a hollow in the opposite jaw, to receive them when the mouth is closed.

They may be divided, from the number of their molar teeth, into two principal subgenera, which are again subdivided into numerous groups.(1) The

(1) Buffon subdivided the monkeys into five tribes: the true *monkeys* without tails; the *baboons* with short tails; the *guenons* with long tails and callous buttocks; the *sapajous* with long prehensile tails and no callus; the *sagouins* with long tails, not prehensile and without callus. Erxleben, adopting this division, translated these names by *simia, papio, cercopithecus, cebus* and *callithrix*. Thus it is, that the names *cebus* and *callithrix*, by which the ancients designated monkeys of Af-

Monkeys, properly so called,

Or those of the eastern continent, have the same number of grinders as Man, but otherwise differing from each other by characters, which have formed the grounds of the following subdivisions. The

Simia, Erxl.—Pithecus, Geoffr.

The Ourangs(1) are the only monkeys of the ancient continent which have no callus on the buttock; their hyoid bone, liver and cæcum resemble those of Man. Their nose is not prominent, they have no cheek-pouches, nor a vestige of a tail. Some of them have arms long enough to reach the ground when standing—their legs, on the contrary, are very short.

S. satyrus, L.; Audeb., pl. 2; Fr. Cuv. pl. 2. (The Ourang-Outang.)(2) Of all animals, this Ourang is considered as approaching most nearly to Man in the form of his head, height of forehead, and volume of brain; but the exaggerated descriptions of some authors respecting this resemblance, are partly to be attributed to the fact of their being drawn from young individuals only; and there is every reason to believe, that with age, their muzzle becomes much more prominent. The body is covered with coarse red hair, the face bluish, and the hinder thumbs very short compared with the toes. His lips are susceptible of a singular elongation, and possess great mobility. His history has been much disfigured by mingling it with that of the other great monkeys, that of the Chimpansé in particular. After a strict and critical examination, I have ascertained

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rica and India, have been transferred to those of America. The genus *Papio*, founded solely on the shortness of the tail, could not be retained, as it violated natural affinities, and all the others required subdividing. It was also necessary to abolish the genus *Ouistitis*, which was comprised in that of the Sagouins, but which does not altogether correspond with the common characters of the other monkeys.

(1) *Orang* is a Malay word signifying *reasonable being*, which is applied to man, the ourang-outang, and the elephant. *Outang* means *wild*, or *of the woods;* hence, Wild Man of the Woods.

(2) The only good figure of the *Ourang-Outang* we had for a long time was that of Vosmaer, taken from a living specimen at the Hague. That of Buffon, Suppl. VIII, pl. 1, is every way erroneous; that of Allamand (Buff. d'Holl. XV, pl. 11,) is somewhat better—it was copied in Schreber, pl. 2, B. That of Camper, copied ib., pl. 2, C, is tolerably exact, but is easily discovered to have been taken from the dead body. Bontius, Med. Ind. 84, gives a completely ideal one, although Linnæus took it for the type of his troglodyte (Amæn. Ac. VI, pl. 1, § 1). There are some good ones in Griffith, and in Kruscnstern's Voyage, pl. 94 and 95, but all of them from young subjects.

that the Ourang-Outang inhabits the most eastern countries only, such as Malabar, Cochin China, and particularly the great island of Borneo, whence he has been occasionally brought to Europe by the way of Java. When young, and such as he appears to us in his captivity, he is a mild and gentle animal, easily rendered tame and affectionate, which is enabled by his conformation to imitate many of our actions, but whose intelligence does not appear to be as great as is reported, not much surpassing even that of the Dog. Camper discovered, and has well described two membranous sacs in this animal which communicate with the glottis, that produce a hoarseness of his voice —he was mistaken, however, in imagining that the nails are always wanting on his hinder thumbs.

There is a monkey in Borneo, hitherto known only by his skeleton, called the *Pongo*,(1) which so closely resembles the Ourang-Outang in the proportions of all his parts, and by the arrangement of the foramina, and sutures of the head, that, notwithstanding the great prominence of the muzzle, the smallness of the cranium, and the height of the branches of the lower jaw, we are tempted to consider him an adult—if not of the species of the Ourang-Outang, at least of one very nearly allied to it. The length of the arms, that of the apophyses of the cervical vertebræ, and the tuberosity of his calcaneum, may enable him to assume the vertical position, and walk upon two feet. He is the largest monkey known, and in size is nearly equal to Man.

Mr J. Harwood, in the Trans. Lin. Soc. XV, p. 471, describes the feet of an ourang, fifteen English inches in length. This announces a very great stature in the animal to which they belonged, and would have led him to the belief that the Pongo is the adult Ourang-Outang, were it not that the skeleton of the Pongo in the College of Surgeons, at London, has one lumbar vertebra more than those of the Ourangs. This,

(1) Audeb. Singes, pl. anat. 2. This name of *Pongo*, a corruption of *Boggo*, which is given in Africa to the *Chimpansé*, or to the Mandrill, was applied by Buffon to a pretended large species of Ourang-Outang—the mere imaginary product of his combinations. Wurmb, a naturalist of Batavia, has transferred it to this animal, which he was the first to describe, and of which Buffon never had any idea. See Mem. of the Soc. of Batavia, vol. ii, p. 245. The thought, that it might be an adult Ourang, struck me on examining the head of an ordinary Ourang, whose muzzle projected much more than those of the very young specimens hitherto described. I described it in a memoir read before the Acad. des Sciences in 1818. Tilesius and Rudolphi appear also to have had it. See the Mem. of the Acad. of Berlin, 1824, p. 131.

however, is no objection—the same variation is frequently observed in the human subject.

The arms of the remaining Ourangs reach only to the knee. They have no forehead, and the cranium retreats from the crest of the eye-brow. The name of Chimpanses might be exclusively applied to them.

S. troglodytes, L. (The Chimpansé)(1) is covered with black or brown hair. Could any reliance be placed on the accounts of travellers, this animal must be equal or superior to man in stature, but no part of it hitherto seen in Europe indicates this extraordinary size. It inhabits Guinea and Congo, lives in troops, constructs huts of leaves and sticks, arms itself with clubs and stones, and thus repulses men and elephants; pursues and abducts, as is said, negro women, &c. Naturalists have generally confounded it with the Ourang-Outang. When domesticated he soon learns to walk, sit, and eat like a man. We now separate the Gibbons from the Ourangs.

Hilobates, Illig.

The Gibbons have the long arms of the true Ourangs, and the low forehead of the Chimpansé, along with the callous buttocks of the Guenons, differing however from the latter in having no tail or cheek-pouch. They all inhabit the most remote parts of India.

S. lar. L.; Buff. XIV, 2; *Onko*, Fred. Cuv. pl. 5 and 6, (The Black Gibbon) is covered with coarse black hairs, and has a whitish circle round his face.

H. agilis, Fred. Cuv. pl. 3 and 4; *Petit Gibbon* of Buffon, XIV, 3, (The Brown Gibbon) is brown—the circle round the face is of a pale red; the lower part of the back is of the same colour. The young are of a uniform yellowish white—it is very agile, and lives in pairs—its Malay name, *Wouwou*, is taken from its cry.

S. leucisca, Schreber, pl. 3, B, (The Cinereous Gibbon) is covered with a soft and ash-coloured wool. The visage is

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(1) This is the *Quojas morou* or the *Satyr of Angola* of Tulpius, who gives a bad figure of it, (Obs. Med., p. 271) and the *Pygmy*, much better represented by Tyson, (Anat. of a Pygmy, pl. 1,) copied by Schreber, pl. 1, B. Scotin had given a tolerable drawing of it, copied Amæn. Acad. VI, pl. 1, fig. 3, and Schreber, 1, C. An individual that lived with Buffon, and which is still preserved in the Museum, is represented, though badly, in the Hist. Nat. XIV, 1, where he is called *Jocko*. The same specimen is much better in Lecat (Traité du Mouv. Muscl. pl. 1, fig. 1), under the name *Quimpese*. Audebert gives the same, but from the stuffed specimen only—he calls it *Pongo*.

black—lives among the reeds, and climbs to the tops of the highest branches of the bamboos, where it balances itself by its long arms. We might separate from the other Gibbons the *Siamang*.

S. syndactila, Raff., Fred. Cuv., pl. 2, (The Siamang) has the second and third toes of the hind foot united by a narrow membrane, the whole length of the first phalanx. It is black—the chin and eyebrows red—lives in numerous troops, which are led by courageous and vigilant chiefs, which, at sunrise and sunset, make the forest ring with the most frightful cries. Their larynx has a membranous sac connected with it.

All the ensuing monkeys of the eastern continent have the liver divided into several lobes; the cæcum thick, short, and without any appendage; the hyoid bone has the form of a shield.

Cercopithecus, Erxl., partim.

The long-tailed monkeys(1) have a moderately prominent muzzle (of 60°); cheek-pouches; tail; callosities on the buttocks; the last of the inferior molares with four tubercles like the rest. Numerous species, of every variety of size and colour, abound in Africa, live in troops, and do much damage to the gardens and fields under cultivation. They are easily tamed.

Simia rubra, Gm.; Buff. XIV, 30; Fred. Cuv. 24. (The Patras.) Red fawn colour above, whitish below; a black band over the eyes, sometimes surmounted with white—from Senegal.

Simia æthiops, L.; Buff. XIV, 32; Fred. Cuv. 24. (The Collared Mangabey.) A chocolate brown above; below and the nape of the neck, whitish; on the head a cap or coif of a lively red; eye-lids white. Buffon says it is from Madagascar, and Hasselquist from Senegal; and in fact Sonnerat declares, there are no monkeys in Madagascar.

Simia fuliginosa, Geoff.; Buff. XIV, 32; Fred. Cuv. 25. (The Mangabey.) A chocolate brown, uniform above, fawn-coloured below; eye-lids white. Buffon says it is from Madagascar, and he believes it to be a variety of the preceding.

Simia sabæa, Lin.; Buff. XIV, 37; Fred. Cuv. 19. (The Green Monkey.)(2) It is greenish above, whitish beneath; face

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(1) *Cercopithecus*, i. e. tailed monkey, a name used by the Greeks.

(2) *Callithrix*, Pliny, l. 8, c. 54, is the name of an Ethiopian Monkey, furnished with a beard and a tufted tail, probably the *Ouanderou*. Buffon arbitrarily applied it to this species.

black; the tufts on the cheeks yellowish; tip of the tail yellow. From Senegal.

Simia faunus, Gm.; *Malbrouc*, Buff. XIV, 29; *Simia cynosuros*, Scopol.; Schr. pl. 14, C; Fred. Cuv. pl. 22, var. of the callithrix; Audeb. 4th fam. 2d sect. pl. 5.(1) Greenish above; limbs ash-coloured; face flesh-coloured; no yellow on the tail; one black, and one white band over the eye-brows; scrotum of a beautiful ultramarine.

Simia crythropyga, Fred. Cuv. pl. 21, (The Vervet) differs from the Malbrouc in the scrotum, which is surrounded with white hairs, the anus with red ones; and from the Grivet, (*S. grisea*) Fred. Cuv. 21, by a green scrotum, encircled with fawn-coloured hairs.

Simia melarhina, Fred. Cuv. pl. 18.; Buff. XIV, pl. 10. (The Talapoin.) Greenish above; tufts of the cheek yellowish; a black nose, in the middle of a flesh-coloured face.

Sim. mona and *S. monacha*, Schreb.; Buff. XIV, 36; Fred. Cuv. 13. (The Mona.) Body brown, limbs black, the breast, insides of the arms, and circumference of the head whitish; black band across the forehead; a white spot at each side of the root of the tail.

Sim. diana, Lin.; *Exquima*, Marcgr.;(2) Audeb. 4th fam. sec. 2, pl. 6, and Buff. Supp. VII, 20. (The Roloway.) Blackish, speckled with white above, beneath white; crupper of a purplish red; face black, surrounded with white; a little white beard on the chin.

Sim. cephus, Lin.; Buff. XIV, 34; Fred. Cuv. 17. (The Moustache.) Ashy-brown; a yellow tuft before each ear; a clear blue band, resembling a reversed chevron, on the upper lip.

S. petaurista, Gm.; Audeb. 4th fam. sec. 2, pl. 13; Fred. Cuv. pl. 16. (The Vaulting Monkey.) Olive-brown above, grey below; visage blue; nose white; a white tuft before each ear; a black moustache.

S. nictitans, Gm.; Audeb. ib. XIV; Fred. Cuv. 13. (The White-nosed Monkey.) Black or brown, speckled with white; white nose; face black; circumference of the lips and the eyes reddish.

These last five species, all small, beautifully variegated in

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(1) The *Cercop. barbatus* of *Clusius*, which Linn. cites as an example of his *faunus*, is rather an *Ouanderou* than a *Malbrouc*.

(2) The figure annexed to the description of the *Exquima* in Marcgrave is that of an *Ouarine*, and that of the *Exquima* is joined to the description of the *Ouarine* or *Guariba*. This transposition has produced many errors in synonymes.

colour, and of a mild and gentle disposition, are very common in Guinea.(1)

SEMNOPITHECUS, Fred. Cuv.

Differs from the Long-tailed Monkeys, by having an additional small tubercle on the last of the inferior molares. They inhabit eastern countries, and their long limbs and very long tail give them a very peculiar appearance. Their muzzle projects very little more than that of the Gibbons, and like them, they have callosities on the buttocks. They appear, likewise, to have no cheek-pouches; their larnyx is furnished with a sac. The one longest known is the

Sim. nemæus, L.; Buff. XIV, 41; Fred. Cuv. pl. 12. Remarkable for its lively and varied colouring; body and arms grey; hands, thighs and feet black; legs of a lively red; the tail and a large triangular spot upon the loins, white; face orange; he has a black and red collar, and tufts of yellow hairs on the sides of the head; inhabits Cochin China.(2)

Another species is remarkable for the very extraordinary form of the nose—it is the

S. nasica, Schr.; Buff. Supp. VII, 11 and 12. (The Kahau.) Yellow, tinted with red; nose extremely long and projecting, in the form of a sloping spatula. This monkey inhabits Borneo, lives in great troops, which assemble morning and evening, on the branches of the great trees on the banks of the rivers—its cry is *kahau*. It is also said to be found in Cochin China.

S. entellus, Dufres.; Fred. Cuv. pl. 8 and 9. (The Entellus.) A light yellowish grey; black hairs on the eye-brows and sides of the head, directed forwards. From Upper Bengal. Is one of the species held in veneration by the Brahmins.

S. melalophos, Raff.; F. C. pl. 7. (The Simpai.) Fur of a very lively red; beneath white; face blue; a crest of black hairs reaching from one ear to the other.

S. comata, Desm.; *S. cristata*, Raff.; Fr. Cuv. pl. 2. *Presbitis mitrata*, Kotzeb. (The Croo.) Fine ash colour below, and the

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(1) Pennant has described certain Guenons without thumbs, *Sim. polycomos* and *Sim. ferruginea*, from which Illiger has constructed his genus *Colobus*, but I have not yet been able to see them, and for this reason have not mentioned them. M. Temminck assures us that their head and teeth resemble those of a Semnopithecus.

(2) M. Diard having transmitted to the Museum several *Doucs* from Cochin China, it has been proved that they have callosities on the buttocks; a fact denied by Buffon, on account of his having seen but one specimen injured by stuffing. The genus *Lasiopyga* of Illiger must consequently be suppressed, as it is based on this error.

tuft of the tail white; black crest on the eye-brows, and the hairs of the top of the head long and turned up, forming a tuft.

S. maura, L.; F. Cuv. pl. 10. (The Negro Monkey.) All black, the young of a brownish yellow. The three latter species are from the straits of Sunda.(1)

Macacus.(2)

All the animals of this denomination have a fifth tubercle on their last molares, and callosities and cheek-pouches like a Guenon. The limbs are shorter and thicker than in a Semnopithecus; the muzzle more projecting, and the superciliary ridge more inflated than in either the one or the other. Though docile when young, they become unmanageable when old. They all have a sac which communicates with the larynx under the thyroid cartilage, and which, when they cry out, becomes filled with air. Their tail is pendent, and takes no part in their motions: they produce early, but are not completely adult for four or five years. The period of gestation is seven months—during the rutting season the labia pudendi, &c. of the females are excessively distended.(3) They are generally brought from India.

Sim. silenus and *leonina*, L. and Gm.; *Ouanderou*, Buff.; Audeb. 2d fam. sect. 1, pl. 3. (The Maned Macaque.) Black; ash coloured mane and whitish beard which surround the head. From Ceylon.

Sim. sinica, Gm.; Buff. XIV, 30; Fr. Cuv. 30. (The Chinese Monkey.) A lively fawn-coloured brown above, white beneath; flesh-coloured face; the hairs on the top of the head arranged in radii forming a sort of hat. From Bengal, Ceylon.

S. radiata, Geoff.; Fr. Cuv. 29. (The Cape Monkey.) Differing from the preceding in a greenish tint.

Sim. cynomolgus and *cynocephalus*, Lin.; *Macaque*, Buff. XIV, 20; Fr. Cuv. 26 and 27. (The Hare-lipped Monkey.) Greenish above, yellowish or whitish below; ears and hands

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(1) There is some variation in their Malay names. Raffles, (Linn. Trans. XIII) calls the *S. comata*, *Chinkau*; the *S. maura*, *Lotong*. Raffles calls the *S. fascicularis* the *Kra*.

(2) *Macaco* is the generic appellation of monkeys on the coast of Guinea, and among the negroes transported to the colonies. Marcgrave mentions a species, which he says has "nares elatas bifidas"—and these vague words, copied from him only, have remained in the character applied to the *Macaque* of Buff. although it has nothing like it.

(3) Hence the observation of Ælian, that monkeys are to be seen in India which have a prolapsus uteri.

black; face and scrotum tawny.(1) The *Aigrette*, *Sim. aygula*, Lin., Buff. XIV, 21, appears to be a mere variety of this one, differing by a longer tuft of hair on the top of the head.

Some of the Macaques are distinguished by a short tail.

M. rhesus.; Rhesus, Audeb. fam. ii; *Patas a queue courte*, ib. pl. 4, and Buff. Supp. XIV, pl. 16; the first baboon figured by Buff. XIV, pl. 19.(2) (The Pig-tailed Baboon.) Greyish; a fawn-coloured tinge on the head and crupper, sometimes on the back; face flesh-colour; tail reaching below the hamstrings. From Bengal. (3)

Sim. menestrinus, L.; *Sim. platypigos*, Schreb.; Audeb. fam. ii, sect. 1, pl. 2.; Fr. Cuv. Mammif. under the name of *Singe à queue de cochon.* (The Brown Baboon.) Deep brown above; black band beginning on the head, and fading as it extends along the back; yellowish round the head and limbs; tail thin and wrinkled.(4)

Inuus, Cuv.

Mere Macaques, which have a small tubercle in lieu of a tail.

S. silvanus, pithecus and *inuus*, Lin.; Buff. XIV, 7, 8; Fr. Cuv. Mammif. (The Barbary Ape.) Completely covered with a light grey-brown hair, and of all monkeys, is the one that suffers least from our climate. He is originally from Barbary, but is said to have become naturalised in the most inaccessible parts of the rock of Gibraltar.(5)

Cynocephalus, C.(6)

The Dog-headed Monkeys, together with the teeth, cheek-pouches and callosities of the Inuus, Cuv., have an elongated muz-

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(1) Add the *Black-faced Macaque*, Fr. Cuv. Mammif. 28, and the other species described in the same work.

(2) The two specimens used by Audebert are still in the Museum. I have examined them and find they are both of one species.

(3) The *Macaque a queue courte* of Buff. Supp. VII, pl. 13, (*Sim. erythræa*, Schr.) appears to me to be a true Macaque (*S. cynomolgus*), whose tail had been amputated.

(4) Add the *Macaque de l'Inde*, and the *Macaque a face rouge*, Fr. Cuv. Mammif.

(5) The *Pitheque* of Buff. Supp. VII, pl. 4 and 5, was a young Magot. His Little Cynocephalus, ib. pl. 6, and the Great and Little Cynocephala of Prosper Alpin are also of that species. Πίθηκος is the Greek term for monkeys in general, and the one whose anatomy has been given by Galen was a Magot, although Camper thought it was an Ourang-Outang. M. de Blainville perceived this mistake, and I have proved it by comparing with these two species, all that Galen has stated respecting the anatomy of his pithecus.

(6) *Cynocephalus*, dog's head, a name well known to the ancients, especially as

zle truncated at the end, in which the nostrils are pierced, giving it a greater resemblance to that of a dog than of any other monkey; their tail varies in length. They are generally large, ferocious and dangerous animals, found mostly in Africa.

C. papio, Desm.; *Sim. sphynx*, Lin.; *Papion*, Buff. (The Guinea Baboon.) Yellow, verging more or less on a brown; tufts of the cheeks fawn-coloured; face black; tail long.(1) They are found of various sizes, owing probably to the difference of age. When full grown, frightful from their ferocity and brutal lubricity. From Guinea.

There is another neighbouring species with a shorter tail, a greener fur, whiter cheek-tufts and a flesh-coloured face, *S. cynocephalus; the Babouin*, Fr. Cuv. Mém. du Mus. IV, pl. 19.

C. porcarius; Sim. porcaria, Bodd.; *S. ursina*, Penn.; *S. sphyngiola*, Herm.; *The Long-faced Guenon*, Penn., and Buff. Supp. VII, pl. 15.; *Black Monkey* of Vaillant;(2) *Chacma*, Fr. Cuv. Mammif. Black, with a green or yellowish glaze, particularly on the forehead; tufts of the cheeks grey; face and hands black; his tail reaches his heel, and ends in a tuft. The adult has a large mane—in every thing else, as to habits and form, resembling the preceding. From the Cape of Good Hope.

C. hamadryas; *Tartarin* of Belon, Ois. fol. 101, or *Papion à perruque; Sim. hamadryas*, L.; *Dog-faced Baboon*, Penn.; *Singe de Moco*, Buff. Supp. VII, 10.(3) A bluish ash-colour; hairs of the ruff, and particularly those of the sides of the head very long; face flesh-coloured. This great Monkey is also among the most libidinous and horribly ferocious of his kind—lives in Arabia and Ethiopia.

There is another species which should be distinguished from other Cynocephala, which is totally black, and without

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the Dog played a conspicuous part in the symbols of the Egyptians, in which it represented *Tot* or *Mercury*.

(1) Those which have been figured as having it short, as the Papions of Buff. XIV, pl. 13 and 14, &c. had it cut off. M. Brongnard was the first who gave a good figure of it, but under the improper name of *Sim. cynocephalus*. His figure is copied by Schreber, pl. 13, B. See the different Papios in the Mammif. Fred. Cuv.

(2) All these factitious species have been established on the good or bad condition of individual specimens of the same species, or on their difference of age.

(3) Copied by Schreber, but badly coloured. There is now a good figure of it in the Mammif. of Fred. Cuv.

a tail—*S. nigra*, Cuv.; but whose head resembles that of the rest. The

Mandrills,

Of all the monkeys, have the longest muzzle (30°); their tail is very short; they are brutal and ferocious; nose as in the preceding.

Sim. maimon and *mormon*, Lin.; *Boggo*, *Choras*, Buff. XIV, XVI, XVII, et Supp. VII, 9. (The Mandrill.) Greyish brown, inclining to olive above; cheeks blue and furrowed. The nose in the adult male becomes red, particularly at the end, where it is scarlet, which has been the cause of its being deemed, erroneously, a distinct species.(1) The genital parts, and those about the anus, are of the same colour. The buttocks are of a beautiful violet. It is difficult to imagine a more hideous or extraordinary animal. He nearly attains the size of a man, and is a terror to the negroes of Guinea. Many details of his history have been mixed up with that of the Chimpansé, and consequently with that of the Ourang-Outang.

Sim. leucophæa, Fred. Cuv. Ann. du Mus. d'Hist. Nat. IX, pl. 37, from a young specimen, and Hist. des Mammif. from the adult. (The Drill.) Yellowish grey; face black; tail very short and thin; in old ones the fur becomes darker, and the chin of a brilliant red.

The Monkeys of America

Have four grinders more than the others—thirty-six in all; the tail long; no cheek-pouches; buttocks hairy; no callosities; nostrils opening on the sides of the nose, and not underneath. All the great Quadrumana of America belong to this division. The large intestines are less inflated, and the cæcum longer and more slender than in those of the eastern continent.

The tails of some of them are prehensile—that is, their extremity can twist round a body with sufficient force to seize it as with a hand. They are more particularly designated by the name of Sapajous, *Cebus*, Erxleben.(2)

At their head may be placed the Alouattes (Mycetes, Illig.), which are distinguished by a pyramidal head, the upper jaw of which descends much below the cranium, as the branches of the lower one

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(1) I have seen, as well as M. Geoffroy, two or three Mandrills, or *S. maimon*, change to the *Choras* or *S. mormon*, in the Menagerie of the Museum. The tuft of hair, which is frequently given as a character of the *mormon*, is often also in the *maimon*.

(2) *Cebus* or *Cepus*, or Κηπος, names of an Ethiopian Monkey, which, from the description of Ælian, lib. xxvii, c. 8, must have been the Patas.

ascend very high for the purpose of lodging a bony drum, formed by a vesicular inflation of the hyoid bone, which communicates with the larynx, and gives to their voice astonishing power, and a most frightful sound. Hence their name of *Howling Monkeys*. The prehensile portion of the tail is naked beneath.

There are several species, whose distinguishing characters are not yet well ascertained, for the colour of the fur on which they are established varies with the age and sex.

Simia seniculus, Buff. Supp. VII, 25. (Red Howling Monkey.) It is often sent to us from the forests of Guiana, where it lives in troops; size that of a large fox; colour, a reddish chesnut, rather deeper at the head and tail. The *Allouatte ourson* (*Stentor ursinus*, Geoff.), Humb. Obs. Zool. I. pl. 30, must differ from it, although slightly; but it would appear that there are many others, some of which are brown or black, others of a pale colour. In certain species this pale tint is peculiar to the females.(1)

The Common Sapajous have the head flat, and the projection of the muzzle very moderate—facial angle 60°.

In some of them, the anterior thumbs are either totally, or nearly so, hidden under the skin, and the prehensile part of the tail naked beneath. M. Geoff. has formed them into a genus by the name of Ateles.(2)

The first species, the *Chamek*, *Ateles pentadactylus*, Geoff.,

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(1) Marcgrave, Braz. 226, speaks of a black *Guariba*, with brown hands, that Spix thought he had found in his *Seniculus niger*. Mem. de Munic, for 1813, p. 333. *Mycetes rufimanus*, Kuhl.

Marcgrave, 227, speaks of another species, all black and bearded, fig. p. 228, under the wrong name of *Exquima*, which must have been, it is probable, the *Mycetes barbatus*, Spix, pl. 32. The female, ib. pl. 33, is of a light yellowish grey. The male must be the *Mycetes niger* of Kuhl and Prince Maximil. de Neuwied. The *Caraia* of d'Azzara, which is black; breast and belly of a dark red; the female brownish; may be referred to this species.

Pr. Max. has another *Mycetes ursinus*, which appears to be much browner than the ursinus of M. Geoffroy, and to approximate nearer to the M. *fuscus*, or the M. *discolor* of Spix, pl. 30 and 34. This latter rather appears to be the *St. fuscus* of Geoffroy.

The *Straw-coloured Alouatte*, *Stentor stramineus*, Geoff. and the *Myc. stramineus*, Spix, pl. 31, of a yellowish grey, appears from its cranium to be of a different species, but it may merely be the female of a preceding one. It is easily seen, also, that if their characters are so uncertain, their synonymes must be much more so.

Add the *St. flavicaudatus*, Geoff. of a black brown, with a yellow streak on each side of the tail.

(2) Ann. du Museum, VII, 260, et seq.

differs again from the others in having a slight projection of the thumb, though but for a single phalanx, but without a nail; its hair is totally black.

A second species the *Mikiri*, *At. hypoxanthus*, Pr. Max.; *Brachyteles macrotarsus*, Spix, pl. i., has also a very small thumb, and sometimes even a nail. The hair is yellowish, ferruginous towards the tail. These two species are separated by Spix under the name Brachyteles. They connect the Atèles with Lagothrix.

The other Ateles to which alone Spix restricts that name—*Coaita*, Buff.—have no apparent thumb whatever. Such are the following:

A. paniscus; Simia panisc. L.; *Coaita*, Buff. XV, 1. (The Coaita.) Completely covered with black hair, like the Chamek, but without any visible thumb; face, flesh-colour.

A. ater, Fr. Cuv. Mammif. (The Cayou.) Face black, like the rest of the body.

A. marginatus, Geoff. *The Chuva*, Humb. or *the Coaita à face bordée*, Ann. Mus. XII, pl. 10. Black, with a border of white hairs round the face.

A. belzebuth; Sim. beelzeb., Briss. *The Marimonda*, Humb. or *Coaita à ventre blanc*, Geoff.; Ann. Mus. VII, pl. 16. Black above; white beneath; circumference of the eyes flesh-coloured.

A. arachnoides, Geoff. Ann. Mus. XIII, pl. 9. (The Spider Monkey.) Fawn-coloured or red; eyebrows black.

All these animals are natives of Guiana or Brazil; their fore-feet are very long and slender, and their gait remarkably slow.(1)

Lagothrix, Geoff.—Gastrimargus, Spix.

Head round, like the Atèles; a thumb like the Alouattes; tail partly naked, like the one and the other. Such are the *L. Humboldii*, Geoff.; *the Caparo*, Humb.; *Gast. olivaceus*, Spix, pl. 28 (The Capparo); and *the Grison; Lag. canus.*, Geoff.; *Gastr. infumatus*, Spix, 29. (The Silver-haired Monkey.) Monkeys from the interior of South America, said to be remarkable gluttons.

The other Sapajous (Cebus, Geoff.) have a round head, distinct thumbs, and the tail hairy, though prehensile. The species are more numerous than those of the Alouatte, and are characterised with nearly as much difficulty.

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(1) They exhibit some remarkable resemblances to man in their muscles. Of all animals, they alone have the biceps of the thigh made like his.

Some of them have the hairs on the forehead of a uniform length, such as the

Sim. appella, L. (The Sajou); and the *S. capucina*, L.; Buff. XV, 4, 5 and 8, 9. (The Capuchin.) Both of them of different browns; in the first, the circumference of the face is blackish; in the second it is whitish; but the shade of colour in all the rest of their bodies varies between a brownish black and a fawn-colour, sometimes even a white. The shoulders and breast are however generally lighter, and the calotte and hands darker.(1)

Others, again, have the hairs of the forehead so disposed as to form a kind of aigrette, such as the

Sim. fatuellus, Gm.; Buff. Supp. VII, 29. (The Horned Sajou.) This animal has a tuft of black hairs on each side of the forehead.(2)

The disposition of these Monkeys is mild and gentle, their motions quick and light, and they are easily tamed. Their name of *Weeping Monkeys* is derived from their soft plaintive voice.

In the Saimiri the tail is depressed, and almost ceases to be prehensile; the head is very much flattened; in the interorbitar partition of the skeleton there is a membranous space. There is only one known; the

Simia sciurea, Buff. XV, 10. (The Siamiri.) Size of a Squir-

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(1) The *Sajous* and the *Sais* vary so much from a brown to a yellow, that were there not intermediate varieties, we should be tempted to make many species of them. Such is the case with the *Sim. trepida, syrichta, lugubris, flavia*, L. and Schreb., as well as some of those distinguished by M. Geoffroy, Ann. du Mus. XIX, 111 and 112. Spix has recently, and in our opinion improperly, multiplied them still more.

We would refer to the *Sajou* (*Sim. apella*, Lin.) the *Cebus robustus*, Pr. Max., which appears to us an *old* one of that species. The *Ceb. macrocephalus*, Spix, pl. 1, does not seem to differ from it, so far as regards the species. We refer to the *Sai* (*S. capucina*, Lin.) the *Sai à gorge blanche*, Buff. (*S. hypolencos*); the *Cebus libidinosus*, Spix, 2; the *Ceb. xanthosternus*, Pr. Max., or the *Ceb. xanthocephalus*, Spix, 3; the *Ceb. cucullatus*, id. 6.

We should be more inclined to consider as distinct species, the *Sajou á pieds dorés*, Fred. Cuv., the *Sajou brun*, *id.* or *Ceb. unicolor*, Spix, pl. 4; the *Sim. flavia*, Schreber, 31, B, from which the *Ceb. gracilis*, Spix, pl. 5, seems to differ only in the stuffing—but that we require numerous observations, made on the spot which these animals inhabit, before we can hope to establish their species in any other than an arbitrary manner.

(2) Here should come the *Cebus cirrhifer*, Geoff. and the *Ceb.* of the same name, of Pr. Max., but which is different. *Ceb. cristatus*, Fred. Cuv.

rel; of a yellowish grey; fore-arms, legs, and the four extremities of a yellowish fawn-colour; end of the nose black.

Those of the *American* monkeys, whose tails are not at all prehensile, are called Sakis.(1) Several of them have that appendage long and tufted, whence they have been also termed Fox-tailed Monkeys: their teeth project forwards more than those of the others. They are the Pithecia of Desmarets and Illiger.

Simia pithecia, L.; Buff. XV, 12; *Pithecia inusta*, Spix, pl. 10. (The Yarke.) Blackish; circumference of the face whitish.

Pith. hirsuta, Spix, pl. 8. (The Grey Sakis.) Grey hands; yellowish.

Simia satanus, Hofmansegg; Humb. Obs. Zool. L. xxvii. (The Black Saki.) All black.

Pith. rufiventris, Geoff.; Buff. Supp. VII, 31; *Pith. capillamentosa*, Spix, pl. 2. (The Red-bellied Saki.) Brown, with a red belly.

Spix distinguishes those species whose tails, although tufted, are shorter than the body, by the name of Brachiurus. His *Br. Ouaraki*, Sp. pl. 8, has a fawn-coloured body; head, neck, arms and feet black. To this should be referred, provided always it is another species, the *Sim. melanocephala*, Humb. Obs. Zool. p. 29; yellow, with a black head.

In some, also, the Callithrix, Geoff. or *Sagouins*, Fr. Cuv. the tail is slender, and the teeth do not project. The Saimiri were associated with them for a long time, but the head of the Sagouins is higher, and their canine teeth much shorter. Such are the

Call. personata, Geoff., Spix, pl. 12.; *Call. nigrifrons*, id. 15. (The Masked Monkey.) A yellowish grey; head and hands black.

Call. lugens; S. lugens, Humb. (The Widow Monkey.) Blackish, with a large white gorget or neck-piece. The *Call. amicta*, Geoff., Sp. pl. 13, and the *Call. torquata*, Hofmansegg, can differ but little from this species.(2)

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(1) All the American monkeys whose tails are not prehensile, together with the Ouistitis, are termed by Buffon Sagouins (Callithrix, Erxl.). This name of *sagouin* or *çagui* is in fact applied in Brazil to all the little Quadrumana, whose tails are not prehensile.

N.B. M. Geoff., Ann. Mus. XIX, 112, 113, gives to his *Callithrix*, which are merely a division of those of Erxleben—*Nocthorus* and *Pithecia*, the common name of *Gcopithecus*.

(2) Add *Call. melanochir*, Pr. Max.—*C. cinerascens*, Spix, pl. 14, is the young of the same according to Temminck.—*C. cuprea*, Spix, pl. 17.—*C. gigo*, id. pl. 16.

NOCTHORUS, Fred. Cuv.—NYCTIPITHECUS, Spix. Improperly called *Aotus* by Illiger.

Only differs from the Sagouins in its great nocturnal eyes, and in the ears, which are partly hidden under the hair. One species only is known.

Nocth. trivirgata, Fred. Cuv., Mammif.; *Nyctipith. vociferans*, Spix, pl. 18. (The Douroucouli.) Ash-coloured above, yellowish beneath; a black vertical line on the middle of the forehead, and one on each temple. It is a nocturnal animal of South America.(1)

They are all from Guiana or Brazil.

OUISTITIS.—HAPALE, Illig.—ARCTOPITHECUS, Geoff.

A small genus, similar to the Sakis, and for a long time confounded with them in the great genus of monkeys. In fact, like the generality of the American monkeys, they have the head round; visage flat; nostrils lateral; buttocks hairy; no cheek-pouches, and, like the Sakis in particular, the tail not prehensile. They have only, however, twenty grinders, like the monkeys of the eastern continent; all their nails are compressed and pointed, those of the hind thumbs excepted, while their anterior ones are so slightly separated from the fingers, that it is with hesitation we assign to them the name of quadrumana. They are pretty little creatures, of agreeable forms, and easily tamed.

M. Geoffroy distinguishes the *Ouistitis*, properly so called, which he names JACCHUS, and whose peculiar characters are pointed inferior incisors, arranged on a curved line, equal to the canines. Their tail is annulated and well covered with hairs; the ears generally ornamented with a tuft.

Sim. jacchus, Lin.; in Paraguay the *Titi*. (The Common Ouistiti.) Tail tolerably well tufted, coloured in rings of brown and white; body greyish-brown; two large tufts of white hairs before the ears. From nearly every part of South America.(2)

N.B. This name of *Gigo* or *Guigo* is given by Pr. Max. to his *Melanochir*, so that we must consider it generic.

(1) Add *Nyctipithec. felinus*, Spix, pl. 18.

(2) It is difficult to establish very specific limits between Ouistitis of different colours. The *Jacch. penicillatus*, Geoff., Spix, pl. 26, has a white spot on the forehead, and the tufts of the ears brown or black.—His *J. leucocephalus*, Pr. Max., lib. 2, has the same tufts, but the whole head and fore part of the neck are white.—His *J. humeralifer* has the breast, shoulders and arms white.—The *J. albicollis*, Spix, pl. 25, has the spot on the forehead, tufts of the ears and a large

M. Geoffroy calls those species which have inferior trenchant incisors placed on a straight line and less than the canines, Midas. Their tail is also more slender and not annulated.

Sim. œdipus, L.; Buff. XV, 17. (The Pinche.) Grey, waved with brown; long white hairs on the head which hang behind the ears; tail slender and red. From the banks of the Amazon.(1)

Mid. rufimanus, Geoff.; *Sim. midas*, L.; Buff. XV, 13. (The Tamarin.) Black, the four extremities yellowish. From Guiana.

Mid. ursulus, Geoff.; Buff. Supp. VIII, 32; *Mid. fuscicollis*, Spix, pl. 20. (The Black Tamarin.) All black; reddish waved stripes on the back.

Mid. labiatus, Geoff.; *M. nigricollis*, Spix, 21. (The White-lipped Tamarin.) Black; crupper reddish; circumference of the nose white.(2)

Sim. rosalia, L.; Buff. XIV, 16. (Lion Monkey or the Marikina.) Yellowish; the head surrounded with a yellow mane; end of the tail brown. From Surinam.

Hapale chrysomelas, Pr. Max. lib. ii. (Black Marikina.) Black fore-arms; upper side of the tail and mane of a golden yellow.

Sim. argentatus, L.; Buff. XV, 18. (The Mico.) Silver grey, sometimes all white; tail brown. From the Amazon.

Lemur, Lin.

The Lemurs, according to Linnæus, comprehend all the Quadrumana which have in either jaw incisors differing in number from four, or at least differently directed from those of the Monkeys. This negative character could not fail to embrace every different beings, while it did not even unite those which should be combined. Geoffroy has established several divisions in this genus which are much better characterized. The four thumbs of these animals are well developed and opposable, and the first hind finger is armed with a pointed, raised nail; all the other nails are flat. Their fur

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collar all white. In some of them, on the contrary, all the white has disappeared. See Annal. du Mus., XIX, p. 119—122.

(1) I suspect the *Mid. bicolor*, Spix, pl. 24, is merely a variety of the *Sim. œdipus*, and his *M. mystax* of the *M. labiatus*.

(2) The *S. leonina*, Humb. Obs. I. pl. 5, is brown, with white lips and black face, like this species; but it appears the hairs of the neck are more thickly set, forming a mane like that of the *Marikina*. Add *Mid. chrysopygus*, Natterer.

is woolly; and their teeth begin to exhibit sharp tubercles catching in each other as in the Insectivora.

LEMUR.—MAKIS, properly so called.

Six incisors in the lower jaw compressed and slanting forwards, four in the upper that are straight, the intermediate ones being separated from each other; trenchant canines; six molares on each side above, six below; ears small. They are very active animals, which, from their pointed heads, have been called *Fox-nosed Monkeys*. Their food is fruit. Their species are very numerous, and are only met with in the island of Madagascar, where they appear to replace the Monkeys, none of which it is said are to be found there. Nearly all the difference that exists between them is in the colour.

L. catta, L.; *Le Mococo*, Buff. XIII, 22. Ashy-grey; tail black, and white rings.

L. macaco, L.; *Le Vari*, Buff. XIII, 27. Variegated with large black and white spots.

L. ruber, Péron; *Le Maki rouge*; Fr. Cuv. Mammif. A lively reddish chestnut; head, hands, tail and belly black; a white spot on the nape of the neck, a red tuft to each ear.

L. mongos, L.; *Le Mongous*; Buff. XIII, 26. All brown; face and hands black; and other neighbouring species, such as *L. albifrons*, Geoff.; *Le Mongous à front blanc;* Audeb., Makis, pl. 3. Brown; forehead white, &c.(1)

INDRIS.—LICHANOTUS, Illig.

Teeth like the preceding, except that there are only four below.

One species only is known; it has no tail; is three feet high; black; face grey; posteriors white, (*Lemur Indri*,) Sonnerat, Voy. I, pl. 86. The inhabitants of Madagascar tame and train it like a dog for the chase.(2)

LORIS.—STENOPS, Illig.

The Lazy Monkeys, as they are called, have teeth like the Makis, the grinders excepted, the points of which are more acute; the short muzzle of a mastiff; body slender; no tail; large eyes; tongue rough.

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(1) Add the *Black Maki*, L.; *Niger*, Edw. 218.—*The Black-fronted Maki* (*L. nigrifrons*, Geoff.).—*The Black-headed Makis* (*L. melanocephalus*), Fr. Cuv.—*The Strawberry Maki.*—*The Red Maki*, Audeb. pl. 2, &c. It is not certain, however, that these species are all distinct. See Geoff., Ann. Mus. XIX, p. 160.

(2) *The Long-tailed Indri*, (*Lemur laniger*, Gm.) Sonnerat, Voy. II. pl. 87, needs revision.

They feed on insects, occasionally on small birds and quadrupeds, their gait is excessively slow, and mode of life nocturnal. M. Carlisle has found that the base of the arteries of the limbs is divided into small branches, as in the true Sloths. Two species only are known, both of them from the East Indies.

Lem. tardigradus, L.; (The Slow Loris, or Sloth of Bengal.) Buff. Supp. VII, 36. Fawn-coloured grey, a brown streak along the back; two of the upper incisors sometimes wanting.(1)

Lem. gracilis, L. (The Slender Loris.) Buff. XIII, 30, and better, Seb. I, 47. Fawn-coloured grey; no dorsal stripe; rather smaller than the preceding; nose more raised by a projection of the intermaxillaries.(2)

Galago, Geoff.—Otolincus, Illig.

The teeth and insectivorous regimen of the preceding; elongated tarsi which produce a disproportion in the dimensions of their hind feet; a long tufted tail; large membranous ears and great eyes, which announce nocturnal habits.

There are several species known, all from Africa.(3) It appears also that we should refer to them an animal of that country (*Lemur potto*, Gm.), Bosman, Voy. in Guin., p. 252, No. 4, whose gait is said to be as slow as that of the Loris and Sloths.

Tarsius.

Elongated tarsi, and all the other details of form belonging to the preceding division; but the space between the molars and incisors is occupied by several shorter teeth; the middle superior incisors are lengthened and resemble canini. The muzzle is very short, and the eyes still larger than those of the Galago. They are nocturnal animals, and feed on insects. From the Moluccas. *Lemur spectrum*, Pall., Buff. XIII, 9.(4)

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(1) The slowness of its gait, which caused it to be mistaken for a Sloth, has induced some authors to maintain, in opposition to Buffon and to truth, that the genus of the Sloths exists also in Asia.

(2) From this difference in the nose, Geoffroy makes of the first species the genus Nycticerus, and of the second that of Loris.

(3) The great Galago, as large as a Rabbit (*Galago crassicaudatus*, Geoff.). The middling one the size of a Rat (*Galago senegalensis*, id.); Schreb. XXXVIII, Bb, Audeb. Gal. pl. 1.—The small one a little less, Brown, Ill. 44.—Compare also the *Galago* of *Demidorf*, Fischer, Mem. des Nat. de Mouscou, I, pl. 1.

(4) Compare the *Tarsius fuscomanus*, Fischer, Annat. des Makis, pl. 3, and the *Tarsius bancanus*, Horsfield, Java.

ORDER III.

CARNARIA.

This order consists of a considerable and varied assemblage of unguiculated quadrupeds, possessing like Man and the Quadrumana the three sorts of teeth, but which have no opposable thumb to their fore-feet. Their food is animal, and the more exclusively so, as their grinders are the more trenchant. Such as have them wholly or partly tuberculous, take more or less vegetable aliment, and those in which they are bristled with points live principally on Insects. The articulation of their lower jaw, being transversely directed and hinge-like, allows of no lateral motion, it can only open and shut.

Although the convolutions of the brain are still tolerably well marked, it has no third lobe, nor does it cover the cerebellum any more than in the following families; the orbit is not separated from the temporal fossa in the skeleton; the cranium is narrowed and the zygomatic arches widened and raised, in order to give more strength and volume to the muscles of their jaws. Their predominant sense is that of smell, and their pituitary membrane is generally spread over numerous bony laminæ. The fore-arm has still the power of revolving in nearly all of them, although with less facility than in the Quadrumana, and they never have the thumb of the anterior extremities opposed to the other toes. On account of the substantial nature of the aliment, and to avoid the putrefaction it would undergo by remaining too long in an elongated canal, their intestines are less voluminous.

There is a great variety in their forms and in the details of

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Travellers should search for certain animals drawn by Commerson, and which M. Geoffroy has had engraved. Ann. Mus. XIX, 10, under the name of *Cheirogaleus*. These figures seem to announce a new genus or subgenus of the Quadrumana.

their organization, which produce analogous differences in their habits, and to such an extent as makes it impossible to arrange their genera on one line, and compels us to form them into several families, which are variously connected by multiplied relations.

FAMILY I.

CHEIROPTERA.

This family still retains some affinity with the Quadrumana by the pendulous penis, and by the mammæ which are placed on the breast. Their distinguishing character consists in a fold of the skin, which, commencing at the sides of the neck, extends between their four feet and toes, supports them in the air, and even enables such of them to fly as have their hands sufficiently developed for that purpose. This disposition required strong clavicles and large scapulæ to give the necessary solidity to the shoulder, but it was incompatible with the rotation of the fore-arm, which would have diminished the force of the stroke requisite for flight. They have all four great canini, but the number of their incisors varies. They have long been divided into two genera, founded upon the extent of their organs of flight. The first of these, however, requires several subdivisions.

Vespertilio, Lin.

The arms, fore-arms and fingers of the Bats are excessively lengthened, forming, with the membrane that occupies their intervals, true wings, possessing even a greater extent of surface than those of Birds—they consequently fly very high, and with great rapidity. The thickness of their pectoral muscles is proportioned to the motions they have to execute, and there is a ridge in the middle of the sternum like that of Birds, to which they are attached. The thumb is short and armed with a claw, by which they are enabled to creep and to suspend themselves. Their hind feet are weak and are divided into five toes, almost always of equal length, armed with trenchant and pointed nails. They have no cæcum. Their eyes are excessively small, but their ears are frequently very large, and together with the wings form a vast membranous surface, which is almost

naked, and so extremely sensible that it is probable they guide themselves through all the sinuosities of their labirynths, even after their eyes have been plucked out, solely by the diversity of the impressions of the air. They are nocturnal, and in our climate pass the winter in a state of stupor. During the day they suspend themselves in obscure places. They generally produce two young ones at a birth, which cling to their mammæ, and whose size is considerable in proportion to that of the mother. This genus is very numerous, and offers many subdivisions. We must begin by separating from it the

Pteropus, Briss.

Trenchant incisors in each jaw, and grinders with flat crowns;(1) the food, consequently, consists chiefly of fruit, of which it destroys considerable quantities; it also successfully pursues birds and small quadrupeds. It is the largest Bat known, and the flesh is eaten. It inhabits the East Indies.

The membrane is deeply notched between the legs; it has no tail, or nearly none; the index finger, which is but half the length of the medius has a third phalanx, and a little nail which is wanting in the other Bats; each of the following fingers, however, has but two phalanges. The muzzle is simple, the nostrils are widely separated, the ears are of a middling size, but without a tragus, and the tongue is bristled with points that curve backwards; the stomach is an elongated sac, unequally inflated. They have never been found out of the south of Asia or the Indian Archipelago.

a. Without tails, and four incisors in each jaw.(2)

P. edulis, Geoff. (The Black Roussette.) Blackish brown, deepest beneath, wings nearly four feet from tip to tip. From the Moluccas and the straits of Sunda, where they are found in great numbers during the day suspended to the trees. To preserve fruit from their attacks, it is necessary to cover it with nets. Their cry resembles that of the goose. They are taken by holding to them a bag fastened to the end of a rod; the flesh is esteemed a delicacy by the natives, but Europeans dislike it on account of its musky scent.(3)

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(1) The grinders have two longitudinal and parallel projections separated by a groove, which wear away by attrition.

(2) Linnæus confounded them under his *Vespertilio vampirus.*

(3) The *Pter. Edwardsii* of Geoff., Edw. 103, fawn-coloured, with a dark brown back, is the young of this species.

Pter. vulgaris, Geoff.; Buff. X, 14. (The Common Roussette.) Brown, face and sides of the back fawn-coloured. From the Isle of France and Bourbon, where it is found on the trees in the forests. Its flesh has been compared to that of the hare and partridge.

Pter. rubicollis, Geoff.; Buff. X, 17. (The Red-collared Roussette.) Greyish brown, the neck red. From the same islands, where it lives in the hollows of trees and in caverns.(1)

b. With a small tail and four incisors in each jaw.

M. Geoffroy was the first who described the species of this subdivision. One of them grey and woolly, *Pter. ægypticus*, is found in the caves of Egypt. A second is reddish, and has a somewhat longer tail, half involved by the membrane—*Pter. amplexicaudus*, Ann. du Mus. tom. XV, pl. 4. From the Indian Archipelago, &c.(2)

c. According to the indicia of M. Geoffroy, we also separate from the Pteropi the Cephalotes which have the same kind of grinders, but whose index, short, and consisting of three phalanges, like that of the preceding, has no nail. The membranes of their wings, instead of meeting at the flank, are joined to each other on the middle of the back, to which they adhere by a vertical and longitudinal partition. Very often they have but two incisors.

C. Peronii, Geoff.; Ann. du Mus., XV, pl. 4. Brown or red. From Timor.

The Pteropi being taken away, we have the true Bats left, which are all insectivorous, and have three grinders on each side in each jaw, bristled with conical points, that are preceded by a variable number of false molars. Their index never has a nail, and, one

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(1) Add *Pter. medius;—Pter. phæops;—Pter. poliocephalus;—Pter. dasymallus;* Temm., Mamm., pl. 10.—*Pter. pallidus;—Pter. Keraudrenius*, Quoy and Gaym., Voy. de Freycinet;—*Pter. griseus*, Geoff. Ann. Mus. pl. 3, XV, vi, cop. Temm., pl. 11;—*Pter. personatus;—Pter. melanocephalus*, Temm. pl. 12.

(2) Add *Pter. stramineus;—Pter. marginatus*, Geoff. loc. cit. pl. 5;—*Pter. minimus*, id. or the *Kiodote*, Fr. Cuv., or the *Pter. rostratus*, Horsf.

M. Isidore Geoffroy—Dict. Class. d'Hist. Nat. article Roussette,—gives us a monography of this genus, in which he forms the *Pter. personatus* of Temm., and some neighbouring species into the subgenus Pachisoma, which has four molars less than the others, and the zygomatic arches more projecting; the *Pter. minimus* or *rostratus* into the subgenus Macroglossa, in which the muzzle is longer and more slender, and where there are spaces between the grinders. Its tongue is thought to be extensible. He, finally, separates the *Céphalote* of Péron from that of Pallas, and gives to the first the name of Hypodermis, on account of the complete dorsal insertion of the membrane of its wings.

subgenus excepted, the membrane is always extended between the two legs.

They should be divided into two principal tribes. The first has three ossified phalanges in the middle finger of the wing, but the remainder, including the index itself, consists of but two.

To this tribe, which is almost exclusively foreign, belong the following subgenera.

Molossus, Geoff.—Dysopes, Illig.

The muzzle simple; ears broad and short, arising near the angle of the lips, and uniting with each other on the muzzle; the tragus short, and not enveloped by the conch. The tail occupies the whole length of their inter-femoral membrane, and, most generally, even extends beyond it. They have very seldom more than two incisors in each jaw, though, according to Temminck, several of them have at first six below, of which four are successively lost.

The Dinops of M. Savi belong to this Molossus, with six inferior incisors. There is one species in Italy—*Dinops cestonii*, Savi, Giorn. de Letter., No. 21, p. 230.

M. Geoffroy calls those in which he has counted four inferior incisors Nyctinomus.(1)

The Molossi, at first, were only found in America;(2) at present, however, we know several of both continents.(3) Some of them have the hinder thumb placed at a greater distance from the first finger than the fingers are from each other, and endowed with a separate motion, a character on which, in a species where it is very strongly marked, M. Horsfield has established his genus Cheiromeles.(4)

It is here, perhaps, that we should also place the Thiroptera of Spix, which appear to have several characters of the Molossi, and

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(1) The *Nyctinome d'Egypte*, Geoff., Eg. Mammif., pl. 2, f. 2, and Temm., Monog. des Mammif. pl. 19;—the *Nyctinome du Brésil*, Isid. Geoff., Ann. des Sc. Nat., I, pl. 22, or *Mol. nasutus*, Spix, pl. 35, f. 7;—the *N. tenuis*, Horsfield, Java, No. 5, and Temm. Monog. pl. 19, bis.

(2) Buffon has three of them confounded by Gmel., under the common name of *Vespertilio molossus; M. longicaudatus*, Buff. X, xix, 2;—*M. fusciventer*, ib. 1;—*M. guyanensis*, id. Supp. VII, lxxv. Since then they have been increased. *M. rufus*, Geoff., Ann. Mus. VI, 155;—*M. alecto*, Temm., Monog., pl. xx;—*M. abrasus*, Temm., ib., pl. xxi;—*M. velox*, Natterer, Temm., pl. xxii, 1;—*M. obscurus*, Geoff., Temm., ib., pl. xxii, 2. These species, however, have not been sufficiently compared with those of Buffon, nor with the *M. ursinus*, Spix, pl. xxxv, f. 4, and the *M. fumarius*, ib., f. 5 and 6.

(3) *M. plicatus; Vespert. plicatus*, Buchan.; Lin. Trans., V. pl. xiii;—*Dysopes ruppelii;* Temm., Monog., pl. xviii.

(4) *Cheiromeles torquatus*, Horsf., Jav. or *Dysopes cheiropus*, Temm., Monog., pl. xvii.

whose thumb has a little concave palette peculiar to them, and by which they are enabled to cling more closely.(1)

NOCTILIO, Lin. Ed. XII.

Muzzle short, inflated, and split into a double hare-lip, covered with odd looking warts and seams; ears separate; four incisors above, and two below; tail short, and free above the inter-femoral membrane.

The species best known is from America. It is of a uniform fawn-colour—*Vespert. leporinus*, Gm., Schreb. LX.(2)

PHYLLOSTOMA, Cuv. and Geoff.

The regular number of incisors is four to each jaw, but a part of the lower ones frequently fall, being forced out by the growth of the canini. They are moreover distinguished by a membrane resembling a doubled leaf, that is placed crosswise on the end of the nose. The tragus of the ear resembles a small leaf, more or less denticulated, The tongue, which is very extensible, terminates in papillæ, which appear to be so arranged as to form an organ of suction—the lips also are furnished with tubercles, symmetrically arranged. They are all from America, run along the ground with more facility than the other bats, and have a habit of sucking the blood of animals.

a. Without a tail.—VAMPIRUS, Spix.

P. spectrum; V. spectrum, Lin.; *Andira-guaçu* of the Brazilians; Seb. LVIII; Geoff. Ann. Mus. XV, xii, 4. (The Vampire.) The leaf funnel-shaped; colour a reddish brown; size, that of a Magpie. From South America. It is accused of causing the death of men and animals by sucking their blood; the wound, however, is small, though it may occasionally prove serious from the effects of the climate.(3)

b. The tail involved in the inter-femoral membrane.

V. hastatus, L. Buff.; XIII, xxxiii. (The Javelin Bat.) The leaf shaved like the head of a javelin, the edges entire.(4)

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(1) *Thir. tricolor*, Spix, 36, f. 9. It is with some hesitation that we have thus placed this subgenus, its description being incomplete.

(2) The *N. dorsatus*, Geoff., or the *N. vittatus*, Pr. Max., has a white stripe down the back.—The *N. albiventer*, Spix, 35, 2 and 4, is fawn-coloured above, white beneath, and rather smaller. Add, *N. rufus*, Spix, 35, 1.

(3) Add *la Lunette; Vesp. perspicillatus*, L.; Buff., Supp. VII, lxxiv; and the three species from Azzara, by Geoff., Ann. du Mus., VI, 181—182.

(4) Add *Philost. elongatum*, Geoff., Ann. Mus., XV, ix.

c. The tail free above the membrane.

P. crenulatum, Geoff. Ann. du Mus. XV, pl. 10. (The Indented Javelin Bat.) The leaf denticulated on the edges.

M. Geoffroy, Mem. du Mus. IV, p. 418, separates from the *Phyllostomæ* those species whose tongues are narrow, susceptible of elongation, and furnished with papillæ resembling hairs—he calls them Glossophaga.

These species are likewise from America.(1)

In the second great tribe of Bats the index has only one bony phalanx, while all the other fingers have two.

This tribe is also divided into several subgenera.

Megaderma, Geoff. Ann. du Mus. XV.

The membrane on the nose, or the leaf, more complicated than that of the Phyllostomæ; the tragus large and most commonly bifurcated; the conchs of the ear ample and soldered together on the top of the head; tongue and lips smooth; the inter-femoral membrane entire, and no tail. They have four incisors below, but there are none above, and their inter-maxillary bone remains cartilaginous.

They are all from the eastern continent, either from Africa, *the Leaf* from Senegal for instance, (*Meg. Frons.*, Geoff.) whose nasal membrane is oval and nearly as large as the head; or from the Indian Archipelago, as the *Spasma* of Ternate, *Vespert. Spasma*, L., Seb. I, lvi.—*La Lyre*, Geoff. Ann. Mus. XV, pl. 12.—*Le Trèfle de Java*, Id. ib., &c. They are distinguished from each other by the figure of the leaf, like the *Phyllostomæ*.

Rhinolophus, Geoff. and Cuv.

The nose of the Horse-shoe Bats, as they are vulgarly called, is furnished with very complex crests and membranes laid upon the chanfrin, presenting the figure of a horse-shoe; the tail long and placed in the inter-femoral membrane. There are four incisors below, and two very small ones above in a cartilaginous inter-maxillary bone.

There are two species of them in France which are very common, discovered by Daubenton.

R. bifer, Geoff., Ann. Mus. XX, pl. 5; *Vesp. ferrum equinum*, L.; and the small one, *Vesp. hipposideros*, Bechst.

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(1) *Vespertilio soricinus*, Pall. Spicil. Fascic. III, pl. 3 and 4, copied Buff. Supp. III, pl. 53.—*Glossoph. amplexicaudatus*, Geoff. Mem. Mus. IV, pl. 18, F. C.—*Gl. caudifer*, Id. ib. pl. 17, fig. A and B.

Buff. VIII, XVII, 2 and 20; Geoff. loc. cit., both of which inhabit quarries solitarily, and suspended by their feet, enveloping themselves with their wings so that no part of the body is visible.(1)

Nycteris, Cuv. and Geoff.

The forehead furrowed by a longitudinal groove, which is even marked upon the cranium, bordered by a fold of the skin which partially covers it; nostrils simple; four incisors without intervals above and six below; ears large and separated; tail involved in the interfemoral membrane. They are African species. Daubenton has described one by the name of the *Campagnol volant*, Buff. X, pl. XX, fig. 1 and 2, the *V. hispidus*, Lin., Schreb. LVI. M. Geoffroy has found others in Egypt.(2)

Rhinopoma, Geoff.

The pit on the forehead less strongly marked; nostrils at the end of the muzzle with a little leaf above, somewhat resembling a currier's knife; ears united; tail extending far beyond the membrane. One is known in Egypt, where it is principally found in the pyramids.(3)

Taphozous, Geoff.

A small round pit on the nose; no recurved leaf to the nostrils; head pyramidal; only two incisors above, and very often none; four trilobate incisors below; ears wide apart, and the tail free above the membrane. The males have a transverse cavity under the throat. A little prolongation of the membrane of the wings forms a sort of sac near the carpus.(4) One species was discovered in the catacombs of Egypt by M. Geoffroy.(5)

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(1) Add the other four species figured, Geoff. Ann. Mus. XX, pl. 5, of which one is the *Vesp. specris*, Schreb. LIX, B. and Péron, Voy. aux Terres, Aust. pl. 35.

(2) *Nyctére de la Thébaïde*, 29, Mammif. 1, 2, 2; and Ann. Mus. XX, pl. 1.—*N. de Java*, Geoff. Ann. Mus. XX, pl. 1.

(3) *Rhinopome microphylle*, Geoff.; *Vesper. microphyllus*, Schr.

(4) It was this that caused Illiger to name the genus which contained the Taphiens *Saccopterix*.

(5) The *Taphien filet*, Eg. Mammif. I, 1, 1.—The *Taphien perforé*, ib. III, 1, which does not appear to differ from the *Lerot volant*, Daub.; *T. senegalensis*, G.—Add the *Vesp. lepturus*, Gm., Schr. LVII.—The *T. of India; V. brachmanus*, G.—The *T. of the Isle of France; T. mauritianus*, G.—The *T. rufus*, Wils. Amer. Ornith. vol. VI, pl. 50, No. 4.—The *T. longimanus*, Hardw. Lin. Trans. vol. and pl. XVII.

Mormoops, Leach.

Four incisors in each jaw, the superior tolerably large, the inferior trilobate; cranium singularly raised like a pyramid above the muzzle; on each side of the nose is a triangular leaf which extends to the ear.(1)

Vespertilio, Cuv. and Geoff.

Muzzle without leaf or other peculiar appendage; ears separate; four incisors above, of which the two middle ones are apart, and six trenchant incisors slightly denticulated below; the tail contained in the membrane. This subgenus is the most numerous of the whole, its species being found in every part of the world. France alone has six or seven.

The tragus of some is shaped like an awl, and to this division belongs the most commonly known species.

Vesp. murinus, L.; *V. myotis*, Kuhl, Buff. VIII, xvi. (The Common Bat.) Tragus oblong, the length of the head; hair brown; maronne above, grey beneath; the young of an ashy grey.

Some other smaller but neighbouring species have lately been observed in Europe.(2)

In others again the tragus is angular, such as the

Vesp. serotinus, L.; Buff. VIII, xviii, 2. (The Serotine Bat.) A deep maronne; wings and ears blackish; the conch triangular and shorter than the head. The female is paler than the male. Found under the roofs of churches, uninhabited buildings, &c.(3)

A third kind has a crescent shaped tragus.

V. noctula, L.; Buff. VIII, xviii, 1; *V. proterus*, Kuhl; *V. lasiopterus*, Schreb., 58, B. Fawn coloured; ears triangular, shorter than the head; tragus rounded, a little larger than the preceding. Found in the hollows of old trees, &c.

V. pipistrellus, Gm.; Buff. VIII, xix, 1. (The Pipistrelle.) The smallest one in France; a blackish brown; ears triangular.(4)

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(1) The species—*Mormoops Blainvillii*, Leach, 1 Lin. Trans. XIII—is from Java.

(2) The *V. Bechsteinii*, Leisler, Chauves. d'Allem., pl. 22.—The *V. mystacinus*, ib. 18.—*V. Daubentoni*, Leisler, Kuhl, pl. xxv, 2.—*V. Nattereri*, Kuhl, pl. 23, &c.—Add foreign species, *V. emarginatus*, Geoff. Ann. Mus. VIII, pl. 46.—*V. pictus*, L. or the *Kirivoula* of Java, Seb. I, pl. 56, f. 23.—*V. polythrix*, Isid. Geoff. Ann. des Sc. Nat. III, p. 440.—*V. levis*, Id. ib. &c.

(3) Add *V. carolinensis*, Geoff. Ann. Mus. VIII, pl. 47. [*See Append. I. of Am. Ed.*]

(4) Add the *V. Kuhlii*, Natterer, Kuhl, Chauves. d'Allem. p. 55.

M. Geoffroy also separates from Vespertilio the

Plecotus, Geoff.

Ears larger than the head, and united on the cranium as in Megaderma, &c.; the tragus large and lanceolate—an operculum on their auditory passage.

The common species—*Vesp. auritus*, L.; Buff. VIII, xvii, 1. (The Long-eared Bat.) Still more abundant in France than the Bat. Its ears are nearly as large as the rest of the body. It lives in kitchens, houses, &c. There is also another discovered by Daubenton—*Vesp. barbastellus*, Gm., Buff. VIII, 19, 2. Brown, with much smaller ears.(1)

Finally, the Nycticeus, Rafinesque, has only two incisors in the upper jaw, along with the moderate ears and simple muzzle of the Vespertilio. The species known are from North America.(2)

Galeopithecus, Pall.

The Galeopitheci differ generically from the Vespertilios, in the fingers, all armed with trenchant nails, which are not longer than the toes, so that the membrane which occupies their intervals, and extends to the sides of the tail, can only act as a parachute. The canini are denticulated and short like the molars. There are two upper denticulated incisors widely separated from each other; below there are six, split into narrow strips, like a comb, a structure altogether peculiar to this genus. The animals belonging to it are found in the Indian Archipelago, on the trees, among which they pursue insects, and perhaps birds. If we can judge by the injury the teeth sustain from age, they use fruit also. Their cæcum is very large.

One species only is well ascertained, the *Flying Lemur.* Audeb., Galæop., pl. 1 and 2. Fur greyish red above, reddish

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(1) Add the *Plec. timoriensis*, Geoff.—*Pl. velatus*, Isid. Geoff.—*Pl. maugei*, Desm.—*Plec. cornutus*, Fab.—*Vesp. megalotis*, Rafin. [*See Append. II. of Am. Ed.*]

N.B. As our plan permits us to class those animals only whose characters we have ascertained either from personal observation or from very complete descriptions and figures, we have been compelled to omit several of the genera of MM. Leach, Rafinesque, &c.; and while on this subject, we must observe that there is no family which stands more in need of revision than that of the Bats—a revision from nature and not by compilation.

(2) *Vespertilio lasiurus*, Schreb., LXII, B.—*V. noveboracensis*, Penn. Quadr., pl. 31, fig. 2.—*Vesp. borbonicus*, Geoff., Ann. Mus. VIII, pl. 46.

These three are the same. [*See Append. III. of Am. Ed.*]

below; spotted and striped with various shades of grey when young. From the Molucca islands, straits of Sunda, &c.

All the other Carnaria have the mammæ situated under the abdomen.

FAMILY II.

INSECTIVORA.

The animals of this family, like the Cheiroptera, have grinders studded with conical points, and lead a nocturnal or subterraneous life. Their principal food is Insects, and in cold climates many of them pass the winter in a torpid state. Unlike the Bats, they have no lateral membranes, although they always have clavicles. Their feet are short, and their motions feeble; the mammæ are placed under the abdomen, and the penis in a sheath. None of them have a cæcum, and in walking they all place the whole sole of the foot on the ground.

They differ from each other by the relative position and proportions of their incisors and canini.

Some have long incisors in front, followed by other incisors and canini, all, even shorter than the molares, a kind of dentition of which the Tarsiers, among the Quadrumana, have already given us an example, and which somewhat approximates these animals to the Rodentia. Others have large separated canini, between which are placed small incisors, the most usual disposition of these parts among the Quadrumana and the Carnaria; and these two systems of dental arrangement are found in genera, otherwise very similar in the teguments, shape of the limbs, and mode of life.

Erinaceus, Lin.

The body of the Hedgehog is covered with spines instead of hairs. The skin of the back is furnished with such muscles, as, by inclining the head and feet towards the abdomen, enable the animal to shut himself up in it, as in a purse, presenting his spines on all sides to the enemy. The tail is very short, and there are five toes to each foot. There are six incisors in each jaw, the middle ones being the

longest, and on each side three false molars, three bristled with points, and a small one studded with tubercles.(1)

E. europæus, L.; Buff. VIII, vi. (The Common Hedgehog.) Ears short; common in the woods and hedges; passes the winter in its burrow, whence it issues in the spring with an amplitude and complication of the vesiculæ seminales that is almost incredible. To insects, which constitute its ordinary diet, it adds fruit, by which at a certain age its teeth become worn. The skin was formerly used to dress hemp.

E. auritus, Pall.; Schreb. CLXIII. (The Long-eared Hedgehog.) Smaller than the preceding; ears as large as the two-thirds of the head, otherwise similar to the europæus in form and habits. It is found from the north of the Caspian sea, as far as Egypt inclusively.

Centenes, Illig.

The body of the Tenrec is covered with spines like the Hedgehog. It does not however possess the faculty of rolling itself so completely into a ball: there is no tail; the muzzle is very pointed, and the teeth are very different. There are four or six incisors, and two great canini in each jaw. Behind the canini are one or two small teeth, and four triangular and bristled molars. Three species are found in Madagascar, the first of which has been naturalized in the Isle of France. It is a nocturnal animal, which passes three months of the year in a state of lethargy, although inhabiting the torrid zone. Brugière even assures us that it is during the greatest heats that they grow torpid.

Erinaceus ecaudatus, L.; Buff. XII, lvi. (The Tenrec.) Covered with stiff spines; only four notched incisors below. It is the largest of the three, and exceeds the hedgehog in size.

Erinaceus setosus, L.; Buff. XII, lvii. The spines more flexible and setaceous; six notched incisors in each jaw.

Erinaceus semi-spinosus. Covered indiscriminately with spines and setæ; striped with yellow and black; its six incisors and canini are all slender and hooked; size hardly that of a Mole.(2)

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(1) Pallas has noted as an interesting fact, that the Hedgehog eats hundreds of Cantharides without inconvenience, while a single one produces the most horrible agony in the Dog and the Cat.

(2) Buff., Suppl. III, pl. 37, has mistaken it for a young Tenrec. Voy. a la Chine, II, p. 140, gives a wrong description of the teeth.

Cladobates, Fr. Cuv.—Tupaia, Raff.

This is a new genus from the Indian Archipelago. The teeth have much affinity with those of the Hedgehog; their middle upper incisors, however, are proportionably shorter, and the four lower ones elongated; there is also no tubercular one behind. The animal is covered with hair, has a long shaggy tail, and, contrary to the habits of other Insectivora, climbs trees with the agility of a Squirrel; the pointed muzzle, however, makes the animal easily distinguishable even at a distance.(1)

Sorex, Lin.

The Shrews are generally small, and covered with hair. Under this, and upon each flank, there is a small band of stiff, thickly set setæ, from between which, in the rutting season, oozes an odorous fluid, the product of a peculiar gland.(2) The two middle upper incisors are hooked and dentated at their base, the lower ones slanting and elongated: five small teeth on each side follow the first, and two only the second. There are moreover in each jaw three bristled molars, and in the upper one, the last is a small tuberculous tooth. This animal lives in holes it excavates in the earth, which it seldom leaves till evening, and lives on worms and insects. One species only was for a long time known in France; the

Sor. araneus, L.; Buff. VIII, x, 1. (The Common Shrew.) Grey above; ash-coloured beneath; tail square, and not so long as the body by one-third; teeth white; ears naked and exposed; common in the fields, &c. This little animal has been accused of producing a disease in horses by its bite; the imputation however is false, and arises, perhaps, from the fact, that though Cats kill the Shrew, they will not eat it on account of its unpleasant odour.

Daubenton has discovered the

Sor. fodiens, Gm.; *S. Daubentonii*, Blumenb.; Buff. VIII, xi. (The Water Shrew.) Rather larger than the common one; black above; white beneath; tail compressed at the end, and not so long as the body by one-fourth; the incisors red at the ends;

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(1) The *banxring; Cladob. javanica*, Fr. Cuv.; *Tupaia javanica*, Horsf. Jav.;—*Cl. tana*, Fr. Cuv.; *Tup. tana*, Horsf.;—*Clad. ferruginea*, Fr. Cuv.; *Tup. ferruginea*, Raff. The genus Gymnura of Vigors and Horsfield—Zoolog. Journ. III, pl. 8, appears to approximate to Cladobates by the teeth, and to the Shrew by its pointed snout and scaly tail. There are five unguiculated toes to each foot, and tolerably stiff setæ growing among woolly hairs. It can only be properly classed when its anatomy is known.

(2) See Geoff., Mem. du Mus., vol. 1, p. 299.

the ear surrounded with white, and almost hidden in the hair; it has the faculty of hermetically closing when the animal dives, while the stiff bristles which fringe its feet give it a facility in swimming, in consequence of which it prefers the banks of creeks and rivulets.

Several Shrews have been observed in Europe, somewhat differing from the preceding ones; but as in this genus the age and season materially affect the colours of the fur, it is by no means certain they are distinct species.(1)

Other countries also have their own, the most remarkable of which is the *S. myosurus*, Pall., Act. Petrop. 1781, part II, pl. 4; *Mus musquée de l'Inde*, Buff. Supp. VII, 71. (The Rat-tailed Shrew.) In its form and colour it resembles our common Shrew, and also has its large naked ears, but the tail is round, furnished with scattering hairs, and is almost as large as that of our Long-tailed Field-mouse. It gives out a strong musky scent which impregnates every thing it touches. It is found throughout India and part of Africa, and is one of the animals the ancient Egyptians were in the habit of embalming.(2)

Mygale, Cuv.

The Desmans differ from the Shrews in two very small teeth placed between the two great lower incisors, and in their two upper

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(1) The *S. leucodon*, Schreb. 159, D, does not appear to me to differ from the common Shrew. I strongly suspect the *S. tetragonurus* and *constrictus*, Herm., Schreb. 159, B and C, or Geoff. Ann. Mus. XVII, pl. 2, f. 3, and pl. 3, f. 1, and even the *S. remifer*, Geoff. Ann. Mus. XVII, pl. 2, f. 1, to be different ages of the Water-Shrew; the *remifer* particularly, whose belly is sometimes white, sometimes black; the *S. lineatus*, Geoff. ib. 181, is an accidental variety of the *tetragonurus* arising from age. The *S. minutus*, Laxmann, Schreb. 161, B, is merely a mutilated specimen of the *S. pygmœus*, Pall.

Such is not the case however with the *S. etruscus*, Savi, which is but half the size of our common species, is blackish, has naked ears, white muzzle and paws, round tail, &c. It is a true and distinct species.

(2) I consider the *S. myosurus*, Pall. and Geoff. Ann. du Mus. XVII, pl. 3, f. 2; the *S. capensis*, id. ib. pl. ii, f. 2; the *S. indicus*, id. Mem. du Mus. I, pl. 15, f. 1, as ages or varieties of one same species, to which I also refer the *S. gigantcus*, Isid. Geoff. Mém. du Mus. XV, pl. 4, fig. 3; perhaps even the *S. flavescens*, Isid. Geoff. ib. Seba figures it, Mus. I, pl. 31, f. 7 and 11—pl. 63, fig. 5, and the white variety, I, pl. 47, f. 4.—Add the *S. murinus*, Lin. of Java, of the size of a mouse; grey; ears naked; tail round and nearly as long as the body.—The *S. brevicaudus*, Say, from North America; blackish, ears concealed, tail one-fourth the length of the body.—*S. parvus*, id. with naked ears.—The *S. suaveolens*, Pall., and the other species pointed out by him in his Zoography of Russia. This genus needs revision as much as that of the Bats. N.B. There are several species in the United States which have not yet been sufficiently examined. *Am. Ed.*

incisors which are flattened and triangular. Behind these incisors are six or seven small teeth and four bristled molars. Their snout is drawn out into a little flexible proboscis, which they keep constantly in motion. Their long tail, scaly, and flattened on the sides, with their feet of five fingers all united by membranes, evidently proclaim them to be aquatic animals. Their eyes are very small, and they have no external ears.

Sorex moschatus, L.; Buff. X; Pall. Act. Petrop. 1781, part II, pl. 5. (The Russian Muskrat.) Nearly as large as a Shrew; above blackish, beneath whitish; tail not so long as the body by one-fourth. Very common along the rivers and lakes of southern Russia, where it lives on Worms, the larvæ of Insects, and particularly on Leeches, which, by means of its flexible snout, it easily withdraws from the mud. Its burrow, which is made in the bank, commences under water, and ascends to such a height as to be above its level in the greatest floods. This animal never comes voluntarily on shore, but numbers of them are taken in the nets of the fishermen. Its musky odour arises from a kind of pomatum that is secreted in small follicles under the tail, and it is so powerful as to be communicated to the flesh of the Pike which feeds on the Desman.

A small species of this genus is found in the rivulets of the Pyrenees, whose tail is longer than its body; ascertained by M. Geoff. Ann. du Mus. tom. XVII, pl. iv, f. 1, *Myg. pyrenaïca*, H.

Chrysochloris, Lacep.

Animals of this genus, like those of the preceding one, have two incisors above and four below; but their grinders are long, distinct and almost all shaped like triangular prisms. Their muzzle is short, broad and recurved, and their fore-feet have only three nails, of which the external, that is very large, much arcuated and pointed, serves them as a powerful instrument for excavating and piercing the earth; the others regularly decrease in size. The hind feet have five of an ordinary size. They are subterraneous animals, whose mode of life is similar to that of Moles. To enable them to dig the better, their fore-arm is supported by a third bone placed under the cubitus.

C. asiaticus; Talpa asiatica, L.; Schreb. CLVII; and better, Brown, Ill. XLV. (The Golden Mole.) A little smaller than the European Mole; no apparent tail; is the only known quadruped that presents any appearance of those splendid metallic tints which brighten and adorn so many Birds, Fishes and Insects. Its fur is a green, changing to a copper or bronze;

there is no conch to the ear, and the eye is not perceptible.(1)

Talpa, Lin.

No one is ignorant of this curious animal, the Mole, whose form so perfectly qualifies it for a subterraneous mode of life. A very short arm attached to a long scapula, supported by a powerful clavicle and furnished with enormous muscles, sustains an extremely large hand, the palm of which is always directed either outwards or backwards; the lower edge of this hand is trenchant, the fingers are scarcely perceptible, but the nails in which they terminate are long, flat, strong and sharp. Such is the instrument employed by the Mole to tear the earth and throw it behind it. Its sternum, like that of Birds and Bats, has a process which gives to the pectoral muscles the size that is required for their functions. To pierce and raise up the earth, it makes use of its long pointed head, whose muzzle is armed at its extremity with a peculiar little bone, and whose muscles are extremely powerful. There is even an additional bone in the cervical ligament. It has but little power behind, and moves as slowly above ground as it advances rapidly under it. Its sense of hearing is very acute, and the tympanum very large, although there is no external ear; its eyes are so small and so hidden by the hair, that for a long time their existence was positively denied. In the genital organs there is this peculiarity—the bones of the pubis are not united, a circumstance which permits it to produce tolerably large young ones, notwithstanding the narrowness of the pelvis. The urethra of the female passes through the clitoris. She has six teats. The jaws are weak, and the food consists of Worms, Insects, and some soft roots. There are six incisors above and eight below. The canini have two roots, which causes them to partake of the nature of false molars; back of them are four false molars above and three below, after which are three bristled molars.

T. europæa, L.; Buff. VIII, xiii. (The Common Mole.) Pointed muzzle; hair soft and black; individuals are found white, fawn coloured and piebald—a vexatious animal in cultivated grounds.

This species, according to Dr Harlan, is also found in North America.(2)

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(1) The *Red Mole of America*, Seba, I, pl. xxxii, f. 1, (*Talpa rubra*, Lin.) is most probably a *Chryso asiaticus*, drawn from a dried specimen of that species, for then the hair appears purple; the *tucan* of Fernandez, App. XXIV, which is considered as synonymous with it, from its two long teeth in each jaw and its vegetable diet, appears to be a Spalax.

(2) A mistake: the europæa is not found here. *Am. Ed.*

M. Savi has found a Mole(1) in the Appennines that is perfectly blind, although otherwise similar to the common one; he calls it *Talpa cæca.*

Condylura, Illig.

In the animals belonging to this genus, the two kinds of dentition peculiar to the Insectivora seem to be combined. In the upper jaw are two large triangular incisors, two extremely small and slender ones, and on each side a strong canine. In the lower one are four incisors slanting forwards, and a pointed but small canine. The superior false molars are triangular and separated, the inferior trenchant and denticulated.

In their feet and the whole of their exterior they resemble the Mole, but their tail is longer, and what more particularly serves to distinguish them from the former, is, that their nostrils are surrounded with little movable cartilaginous points, which, when they separate, radiate like a kind of star.

One species particularly is found in North America—*Sorex cristatus*, L.(2) (The Radiated Mole.) Similar to the Mole of Europe, the nose excepted, but having a tail more than double the length of that of the latter.

Scalops, Cuv.

Teeth very similar to those of the Desmans, except that the small or false molars are less numerous; the muzzle is simply pointed, like that of the Shrew; their hands are widened, armed with strong nails fitted to excavate the earth, and exactly similar to those of Moles: in fact their mode of life is the same; their eyes are equally as small, and their ears quite as much hidden. The only species known is the

S. aquaticus; Sorex aquaticus, L.; Schreb. CLVIII. It appears to inhabit a great part of North America, along rivers,

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(1) It is not *perfectly* blind; the eye-lids have an opening, though smaller than in the common one.

The existence of the optic nerve in the common Mole has been denied. I think I can demonstrate it throughout its entire course.

(2) This is the Condylura of Illiger, but the characters he indicates, taken from the figure of La Faille, copied Buff. Supp. VI, xxxvi, 1, and on which he composed the name of the genus, are false. M. Desmarets was the first who correctly described the teeth of this animal.

Dr Harlan describes a species, *Cond. macroura*, which has but very short points about the nostrils, and a scaly compressed tail. He associates with it as a third species, the *Talp. longicaudata*, Penn. Hist., No. 443, which he appears however not to have seen.

&c. Its external resemblance to the common Mole of Europe (1) is so great, that it is easy to mistake the one for the other.

FAMILY III.

CARNIVORA.

Although the term carnivorous is applicable to all unguiculated animals, not quadrumanate, that have three sorts of teeth, inasmuch as they all use more or less animal aliment, there are, however, many of them, the two preceding families especially, which are compelled by weakness and the conical tubercles of their grinders to live almost entirely on Insects. It is in the present family that the sanguinary appetite for flesh is joined to the force necessary to obtain it. There are always four stout, long, and separated canini, between which are six incisors in each jaw, the root of the second of the lower ones being placed a little more inwards than the others. The molars are either wholly trenchant, or have some blunted tuberculous parts, but they are never bristled with conical points.

These animals are so much the more exclusively carnivorous, as their teeth are the more completely trenchant, and the proportions of their regimen may be calculated from the extent of the tuberculous surface of their teeth, compared with that which is trenchant. The Bears, which can live altogether on vegetables, have nearly all their teeth tuberculated.

The anterior molars are the most trenchant; next comes a molar, larger than the others, usually furnished with a larger or smaller tuberculous heel; then follow one or two small teeth, that are perfectly flat. It is with these small teeth in the back part of the mouth that the dog chews the grass he sometimes swallows. We will call, with M. Fr. Cuvier, this large upper molar, and its corresponding one below, *carnivorous teeth;* the anterior pointed ones, *false molars;* and the posterior blunted ones, *tuberculous teeth.*

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(1) It is the *Common Mole* of the United States. *Am. Ed.*

It is easy to conceive that those genera which have the fewest false molars, and whose jaws are the shortest, are those best adapted for biting.

It is upon these differences that the genera can be most surely established.

It is necessary, however, that the consideration of the hind foot should be added to them.

Several genera, like those of the two preceding families, in walking, or when they stand erect, place the whole sole of the foot on the ground, a fact proved by the total want of hair on that part of it.

Others, and by far the greater number, walk on the ends of the toes, by raising up the tarsus. They are much swifter, and to this first difference are added many others of habits, and even of internal conformation. In both the clavicle is a mere bony rudiment suspended in the muscles. The

PLANTIGRADA

Form this first tribe, in which the whole sole of the foot is placed on the ground in walking, a circumstance which gives them a greater facility in standing vertically upon their hinder feet. They partake of the slowness and nocturnal life of the Insectivora, and, like them, have no cæcum: most of those that inhabit cold countries pass the winter in a state of torpor. They all have five toes to each foot.

Ursus, Lin.

Bears have three large molars on each side(1) in each jaw, altogether tuberculous, and of which the posterior upper, and anterior lower are the longest. They are preceded by a tooth a little more trenchant, which is one of the carnivorous teeth of this genus, and by a variable number of very small false molars, which are sometimes shed at a very early period. This almost frugivorous sort of dentition is the reason why, notwithstanding their great strength, they seldom eat flesh unless from necessity.

They are large stout-bodied animals, with thick limbs, and a very

(1) We shall hereafter omit the repetition of the words "on each side," &c., it being understood that we speak of the molars on one side only, those of the other being the same.

short tail: the cartilage of the nose is elongated and movable. They excavate dens or construct huts, in which they pass the winter in a state of somnolency more or less profound, and without food. It is in these retreats that the female brings forth.

The species are not easily distinguished by apparent characters. We have the

U. arctos, L., Buff. VIII, xxxi. (The Brown Bear of Europe.) Forehead convex; fur brown, more or less woolly when young, and growing smoother with age. Some of them are greyish, others almost yellow, and a third kind is brown, with shades bordering on silver. The relative height of their legs is equally variable, and all without any fixed relation to age or sex. They have most commonly, when young, a whitish collar, which, in some varieties, remains for a longer or shorter period, and even for life. This animal inhabits the lofty mountains, and great forests of Europe, and of a great part of Asia; the coupling season is in June, and the young are produced in January. It sometimes lodges very high up in trees; when young its flesh is esteemed a delicacy—the feet are considered good at all ages.

It is thought that the *Black Bear of Europe* is a distinct species: those which have been described as such had a flat forehead, and the fur woolly and blackish; their origin, however, does not appear to us to be very authentic.(1)

U. americanus, Gm.; Fr. Cuv. Mammif.; Schreb. pl. 141, B. (The North American Black Bear.) A very distinct species, with a flat forehead, smooth and black fur, and fawn-coloured muzzle. We have always found the small teeth behind the canini more numerous in this Bear than in the European species. Individuals have been seen that were entirely fawn-coloured. Its usual food is wild fruits; it devastates the fields,

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(1) We are not yet satisfied that the Grisly Bear of North America differs specifically from the Brown Bear of Europe.

P.S. Since the above note was written, General La Fayette has presented a Grisly Bear to the Menagerie du Jardin du Roi. In form and hair, some shades of colouring excepted, it closely resembles the Brown Bear; its nails, however, are much longer and more trenchant. It appears to be a distinct species.

M. Horsfield, Lin. Trans., XV, 332, describes a Bear from Nepaul, of a light bay colour, whose nails are less trenchant than those of the other Bears of India, and which appears to him a distinct species.

I have neglected stating in the text that we have recovered many fossil bones of lost species of Bears, the most remarkable of which are the *U. spelæus*, Blumenb., with a rounded forehead, and of a very large size; and the *U. cultridens*, Cuv. See the fourth vol. of my "Ossemens Fossiles."

and, where fish is abundant, proceeds to the shores for the purpose of catching it. It is only for want of other aliment that it attacks quadrupeds. The flesh is held in great esteem. There is another Black Bear found in the Cordilleras, with a white throat and muzzle, and large fawn-coloured eye-brows, that unite on the forehead—*U. ornatus*, Fr. Cuv. Mammif.

The East Indies also produce several Bears of a black colour, such as the

U. malaianus, Horsf. Java. (The Malay Bear.) Smooth; black; fawn-coloured muzzle; a heart-shaped spot of the same colour on the breast. From the Peninsula beyond the Ganges and the islands of the straits of Sunda. It is very injurious to the cocoa nut trees, which it climbs in order to devour their tops and drink the milk of the fruit.

U. thibetanus, Fr. Cuv. Mammif. (The Thibet Bear.) Black; the under lip and a large mark in the form of a Y on the breast white; profile straighter and claws weaker. From the mountains in the north of India.

The most remarkable however of these Bears of India is the *U. labiatus*, Blain.; *L'Ours jongleur*, Fred. Cuv. Mammif.; *U. longirostris*, Tied. (The Thick-lipped Bear.) The cartilage of the nose dilated; the tip of the under lip elongated, both being movable; when old, very thick, bushy hairs round the head. The incisors being easily lost, occasioned it for a long time to be considered as a Sloth.(1) It is black; the muzzle and tips of the paws fawn-coloured or whitish, and a half collar or spot in the form of a Y under the neck and breast. This animal is a favourite with the Indian jugglers on account of its deformity.

U. maritimus, L.; Cuv. Ménag. du Mus., 8vo, p. 68; copied, Schreb. pl. cxli. (The Polar Bear.) This is another species, very distinguishable by its long and flattened head and its white and smooth fur. It pursues Seals and other marine animals. Exaggerated accounts of its ferocity have rendered it highly celebrated.

Procyon, Storr.

The Raccoons have three back tuberculous molars, the superior of which are nearly square, and three pointed false molars in front, forming a continuous series to the canines, which are straight and

(1) It is the *Bradypus ursinus* of Shaw, and the genus Prochilus, Illig. See Jour. de Phys. of 1792, vol. xl, p. 136.

compressed. The tail is long, but the remainder of the exterior is that of a Bear in miniature. They rest the whole sole of the foot on the ground only when they are stopped; when they walk, they raise the heel.

P. lotor; Ursus lotor, L.; *Mapach* of the Mexicans; Buff. VIII, xliii. (The Raccoon.) Greyish brown; muzzle white; a brown streak across the eyes; tail marked with brown and white rings. This animal is about the size of a Badger, is easily tamed, and remarked for a singular habit of eating nothing it has not previously dipped in water. From North America—lives on eggs, Birds, &c.

P. cancrivorus; Ursus cancriv., L.; Buff. Supp. VI, xxxii. (The Raccoon Crab-eater.) A uniform light ash-brown; the rings on the tail less distinct. From South America.

Ailurus, Fred. Cuv.

The Panda appears to approximate to the Raccoon in its canini, and what is known of its other teeth; with this exception, that it has only one false molar. The head is short; tail long; walk plantigrade; five toes with retractile claws.(1) One species only is known, the

A. refulgens, Fred. Cuv. Mammif.; Hardwick, Linn. Trans. XV, p. 161. Size of a large Cat; fur soft and thickly set; above of the most brilliant cinnamon red; behind more fawn-coloured; beneath of a deep black. The head is whitish, and the tail marked with brown rings. This most beautiful of all known quadrupeds, and which inhabits the mountains of the north of India, was sent to Europe by my son-in-law the late M. Alfred du Vaucel.

Ictides, Valen.

The Benturong is somewhat related to the Raccoon by its teeth, but the three upper back molars are much smaller and less tuberculous, the last one in each jaw particularly, which is very small and nearly simple. It is covered with long hair, and has a tuft at each ear. The tail is long, hairy, and has a propensity to curl, as if prehensile.

This animal is also one of those from India, for the knowledge of which we are indebted to the late M. du Vaucel. One species, is the

Ict. albifrons, Fr. Cuv., Ann. des Sc. Nat. IV, pl. i. Grey; tail and sides of the muzzle black; size, that of a large Cat. From Bootan.

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(1) General Hardwick has described the upper teeth of the Panda, Lin. Trans. XV, pl. ii. There are four square and tuberculous grinders, and one false trenchant molar in front, at a short distance from the canine.

Ict. ater, Fr. Cuv. Mammif. Black; muzzle whitish; size that of a stout Dog. From Malacca.(1)

Nasua, Storr.

The Coatis, to the teeth, tail, nocturnal habit, and slow dragging gait of the Raccoon, add a singularly elongated and flexible snout. The feet are semi-palmate, notwithstanding which they climb trees. Their long claws are used for digging. They inhabit the warm climates of America, and their diet is nearly the same as that of the Marten of Europe.

Viverra nasua, L.; Buff. VIII, xlviii. (The Red Coati.) Reddish fawn colour; muzzle brown; tail with brown rings.

Viv. narica, L.; Buff, VIII, xlviii. (The Brown Coati.) Brown, white spots over the eye and snout.

This is perhaps the only proper place for the singular genus of the Kinkajous or Potto, Cuv.—Cercoleptes, Illig.—which, to a plantigrade walk, adds a long prehensile tail like that of the Sapajous, a short muzzle, a slender and extensible tongue, two pointed grinders before, and three tuberculous ones behind.

Only one species is known, *Viverra caudivolvula*, Gm.; Buff. Supp. III, 1; and better, Fr. Cuv. Mammif. From the warm parts of America and from the great Antilles, where it is called *Potto;* size of a Polecat; hair woolly, and of a grey or yellowish brown; habits nocturnal, of a mild disposition, and lives on fruit, milk, honey, blood, &c.

Meles, Storr.

The Badgers, which Linnæus placed with the Raccoons in the genus Ursus, have a very small tooth behind the canine, then two pointed molars followed in the upper jaw by one that we begin to recognize as carnivorous from the trenchant vestige it exhibits on its outer side; behind this is a square tuberculous one, the largest of all. Below, the penultimate begins to show a resemblance to the inferior carnivorous teeth, but as there are two tubercles on its internal border as elevated as its trenchant edge, it acts as a tuberculous one; the last below is very small.

The slow movements of the Badgers and their nocturnal habits are like those of the preceding animals; their tails are short, the toes are much enveloped in the skin, and they are otherwise peculiarly distinguished by a sac under the tail, from which oozes a fatty,

(1) Add *l'Ictide doré*, Fred. Cuv.

fetid humour. The long claws of their fore-feet enable them to dig with great effect.

M. europæa; Ursus meles, L.; Buff. VII, vii. (The Badger.) Greyish above, black beneath, a blackish band on each side of the head. The American Badger (*Mel. hudsonius*) is not very different. [*See App. IV. of Am. Ed.*]

Gulo, Storr.

Linnæus also placed the Gluttons among the Bears, but they approximate much nearer to the Weasels in their teeth as well as in their habits, the only relation they have to the former consisting in their plantigrade motion. They have three false molars above and four below, immediately antecedent to the carnivorous teeth, which are well characterized, and behind them two small tuberculous ones, the upper being more broad than long. Their superior carnivorous tooth has only one small tubercle on the inner side, and in fact, the whole dental system is nearly the same as that of the Weasels. The tail is of a middling size, with a plait or fold beneath in place of a sac, and the port of the animal is very similar to that of the Badger.

The most celebrated species is the Glutton of the north, the *Ursus gulo*, L., Buff. Supp. III, xlviii. (The Common Glutton.) About the size of the Badger; usually of a fine deep maronne colour, with a disk on the back of a darker brown; sometimes, however, the shades are lighter. It inhabits the most glacial regions of the North, is considered very sanguinary and ferocious, hunts during the night, does not become torpid during the winter, and masters the largest animals by leaping upon them from the top of a tree. Its voracity has been ridiculously exaggerated by some authors. The *Wolverene* of North America (*Ursus luscus*, Lin. Edw. 103) does not appear to differ from it in any constant character—its colours, however, are generally lighter.

Hot climates produce some species which can only be placed near the Gluttons, as they differ from them merely in having one false molar less in each jaw, and in a long tail. Such are the animals, termed by the inhabitants of South America *Ferrets*, which, having the teeth of our Ferrets and Polecats, have, in fact, similar habits—they are distinguished from them, however, by their plantigrade motion.

Viverra vittata, L., Buff. Supp. VIII, xxiii and xxv. (The Grison.) Black; top of the head and neck grey; a white band, reaching from the forehead to the shoulders.

Mustela barbara, L., Buff. Supp. VII, lx. (The Taira.)

Brown; top of the head grey; a large white spot under the throat.

These two animals are found in all the warm climates of America, and smell strongly of musk. Their feet are somewhat palmated, and it appears they have sometimes been taken for Otters.(1)

Ratelus, F. C.

The Ratels have a false molar in each jaw less than the Grison, and their upper tuberculous tooth is but slightly developed, so that in the teeth they approach the Cat, while their whole exterior is that of the Grison or Badger. The legs are short; feet plantigrade, and five toes to each; nails very strong, &c. &c.

One species only is known, the *Viverra mellivora*, Sparm.; and *Viv. capensis*, Schreb. pl. 125. Size of the European Badger; grey above; black beneath, with a white line that separates the two colours; sometimes it is nearly all white above. It inhabits the Cape of Good Hope, and digs up the earth with its long claws, in search of the honey-combs of the wild bees. The

DIGITIGRADA

Form the second tribe of the Carnivora. The animals which compose it walk on the ends of their toes.

In the first subdivision there is only one tuberculous tooth behind the upper carnivorus; these animals, on account of the length of their body, and the shortness of their legs, which permit them to pass through the smallest openings, have been styled *vermiform*. Like the preceding ones, they have no cæcum, but they are not torpid during the winter. Linnæus placed them all in one genus, that of

Mustela, Lin.,

Or the Weasels, which we will divide into four subgenera.

Putorius, Cuv.

The Polecats are the most sanguinary of all; the lower carnivorous tooth has no inner tubercle, and the superior tuberculous one

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(1) It is supposed by the description given by Marcgrave of his *cariqueibeiu*, which name Buffon has applied to his *saricovienne*, Vol. XIII, p. 319, that he meant to speak of the Taira.

is more broad than long; there are only two false molars above and three below. These animals are externally recognised by their muzzle, which is shorter and thicker than that of the Weasel. They all diffuse a most horrible stench.

Mustela putorius, L., Buff. VII, xiii. (The Common Polecat.) Brown; flanks yellowish; white spots on the head; the terror of poultry-yards and warrens.

M. furo, L., Buff. VII, xxv and xxvi. (The Ferret.) Yellowish, with rose-coloured eyes, and is perhaps a mere variety of the Polecat. It is only found in France in a domesticated state, and is employed to *ferret* out the rabbits from their holes. It comes from Spain and Barbary.

M. sarmatica; The Perouasca; Pall. Spic. Zool. XIV, iv, 1; Schreb. CXXXII. (The Sarmatian Weasel.) Brown; everywhere spotted with yellow and white. So beautifully is the skin mottled, that it is in high request among furriers. It is found throughout all southern Russia, Asia Minor, and the coast of the Caspian sea.

M. sibirica, Pall. Spic. Zool. XIV, iv, 2. (The Siberian Polecat.) A uniform light fawn colour; nose and circumference of the eyes brown; end of the muzzle and the under part of the lower jaw white.

It is also to this subdivision that we must refer two small European species:

M. vulgaris, L., Buff. VII, xxix, 1. (The Weasel.) Of a uniform red, and the

M. erminea, L., Buff. VII, xxix, 2, and xxxi, 1. (The Stoat.) Red in summer, white in winter; end of the tail always black. Skin much used by furriers.

We should also place near it the

M. lutreola, Pall. Spic. Zool. XI, 1; Leche, Stock. Mem., 1739, pl. xi; Schreb. CXXVII. (The Mink or Norek.) It frequents the shores of rivers, &c., in the north and east of Europe from the Arctic Ocean to the Black Sea, and lives on frogs and crabs. The feet are slightly palmated at the base of the toes, but the teeth and round tail approximate it nearer to the Polecat than the Otter. It is of a reddish brown; the circumference of the lips and the under part of the jaw white; it exhales a musky odour, and is much esteemed for its well known fur.

The above animal is considered by some to be the same as the *Polecat of the North American rivers*, also called the *Mink*, whose feet are likewise semi-palmated; but the only white

about it is on the point of the chin, and sometimes a narrow line under the throat—it is a different species.(1)

Warm climates also have their Polecats or Weasels.

Put. nudipes, Fred. Cuv. Mammif. (The Javanese Ferret.) Golden-yellow; head and tip of the tail white.

Put. africanus, Desm. (The African Ferret.) Reddish fawn colour above; yellowish white below; a red band reaching longitudinally along the middle of the belly from the fore to the hind legs.

Put. striatus, Cuv. (The Striped Madagascar Ferret.) Size of the European Weasel; reddish brown, with five longitudinal white stripes; beneath and the tail nearly all white.

Put. zorilla; Zorille, Buff.; *Viverra zorrilla*, Gm.; Buff. XIII, xl, 1. (Cape Polecat.) Irregularly striped with black and white; an animal that has been so far confounded with the mephitic weasels as to receive the name of *Zorillo*, or little Fox, which the Spaniards have applied to those fetid American animals. It approaches them in its claws, which are fitted for digging, but in every thing else resembles the Polecats. They indicate a subterraneous habit, which might induce us to separate it from the other species.

Mustela, Cuv.

The true Weasels differ from the Polecats in having an additional false molar above and below, and in the existence of a small internal tubercle on their inferior carnivorous tooth, two characters which somewhat diminish the cruelty of their nature.

There are two species in Europe closely allied to each other, the

M. martes, L.; Buff. VII, xviii. (The Common Marten.) Brown; a yellow spot under the throat. Inhabits the woods.

M. foina, L.; Buff. VII, xviii. (The Beech Marten.) Brown; the whole under part of the throat and neck white. Inhabits houses. Both species are very destructive. Siberia produces the

M. zibellina, Pall. Spic. Zool. XIV, iii, 2; Schreb. CXXXVI. (The Sable.) Highly valued for its rich fur; brown, spot-

(1) When this page was written, I had no other knowledge of the Norek, or Mink of Europe, than what the description of Pallas afforded me. Having since then procured some specimens, I have ascertained that the white about the jaws is not permanent, and that very frequently the only white to be seen is at the end of the lower jaw, as in the American Mink. I now think they are both one species.

ted with white about the head, and distinguished from the preceding ones by the extension of the hair to the under surface of the toes. It inhabits the coldest mountains, and the hunting to obtain it, in the midst of winter and tremendous snows, is a perilous and painful undertaking. It is to the pursuit of this animal that we owe the discovery of the eastern countries of Siberia.

North America also possesses several Martens indicated by naturalists and travellers, under the indefinite names of *Pekan*, *Vison*, *Mink*, &c.

One of them, the *White Vison* of the furriers, *Mus. leutreocephala*, Harl., has as hairy feet and almost as soft a fur as the Sable, but is of a light fawn colour, and almost white about the head.

That which we call the *Pekan; Must. canadensis*, Gm., and which comes from Canada and the United States, is of a brownish colour, mixed with white on the head, neck, shoulders and top of the back; nose, crupper, tail and limbs blackish.(1)

Mephitis, Cuv.

The Skunk, like the Polecat, has two false molars above and three below, but the superior tuberculous one is very large, and as long as it is broad, and the inferior carnivorus has two tubercles on its internal side, circumstances which ally it to the Badger just as the Polecat approximates to the Grison and Glutton. Independently of this, the anterior nails of the Skunk, like those of the Badger, are long and fitted for digging; they are moreover semi-plantigrade, and the resemblance extends even to the distribution of their colours. The whole family are remarkable for their fetid exhalations, but the Skunk is pre-eminently distinguished by its most horrible and suffocating stench.

Skunks are generally marked with white stripes on a black ground, but the number of stripes appears to vary in the same species. The most common species of North America is the *M. putorius.; Viverra putor.*, Gm.; Catesb. Carol. II, lxii. Schreb. CXXII. (The American Skunk.) Black, with stripes of white, larger or smaller, and more or less numerous; the tail is black, and the tip white. The odour it produces resembles

(1) It is the *Pékan* of Daubenton, but it has not always the white under the throat. [*See Append. V. of Am. Ed.*]

There are several other species of Polecats or of Martens indicated by MM. Molina, Humboldt and Harlan; but they require re-examination.

that of the Polecat, mingled with a strong smell of garlic—nothing is more nauseous.

It would seem that in South America the species most usually encountered has a white tail. The stripes on the back sometimes occupy its whole breadth; it is the *Viverra mephitis*, Gm.; Buff. XIII, xxxix, or the *Chinche*.(1)

We may make a distinct subgenus of the Mydaus, Fred. Cuv. whose teeth, feet, and even colours are similar to those of the Skunk, but whose truncated muzzle resembles a Hog's snout; the tail being reduced to a small pencil. One species only is known, the

M. meliceps, Fred. Cuv., and Horsf. Java. (The Teledu.) Black; the nape of the neck, a stripe along the back and the tail white; the dorsal stripe sometimes interrupted in the middle; not surpassed in stench by any of the Skunks.

Lutra, Storr.

The Otters have three false molars in each jaw, a strong heel to the superior carnivorus, a tuberculus on the inner side of the inferior one, and a large tuberculous tooth above that is nearly as long as it is broad. The head is compressed, and the tongue demi-asperate. They are otherwise distinguished from all the preceding subgenera by palmated feet, and a horizontally flattened tail, two characters which render them aquatic. Their food is fish.

L. vulgaris; Mustela lutra, L.; Buff. VIII, xi. (The Common Otter.) Brown above, whitish round the lips, on the cheeks and the whole inferior surface of the body. It is sometimes found spotted and whitish. From the rivers of Europe.

Several Otters differ but little from the above. That of Carolina, *L. lataxina*, Fr. Cuv., becomes a little larger, is sometimes more deeply coloured, and has a brownish tint beneath; very frequently, however, there is no difference even in the shades of colour. In Brazil there are others similar in every respect to those of Carolina. That of the East Indies the *L. nair*, Fr. Cuv., (The Pondicherry Otter) appears a little smoother, and is somewhat pale about the eye-brows, but it is scarcely perceptible. The Indians employ it for fishing, as we

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(1) It is better figured, Hist. des Mammif. of Fr. Cuv. The Chili Skunk, Buff. Supp. VII, pl. lvii, appears to be a mere badly preserved variety of the same. See my Ossemens Foss. IV, 469.

N.B. This is the same animal with the immediately preceding species, and has been called the *V. conepatl* and *V. chinche*. No two individuals of this species are alike, being sometimes even wholly white or the reverse. *Am. Ed.*

do the Dog for hunting. That of Java, *L. leptonyx*, Horsf. (The Javanese Otter) has a whiter throat, and this whiteness ascends on the sides of the head so as to surround the eye. In that of the Cape, *L. capensis*, Fr. Cuv. the white on the throat, sides of the head and neck is purer and more extended; the end of the nose is even marked with it: what particularly distinguishes it, however, is that, at least at a certain age, it has no nails, a character on which M. Lesson has founded his genus Aonyx. Young individuals however have been brought from the Cape that have nails; it remains to be ascertained whether or not they are of the same species.

Mustela lutra brasiliensis, Gm. (The American Otter.) Brown or fawn-coloured; throat white or yellowish; a little larger than the European Otter; the body is also longer, and the hair shorter. It is distinguished by the end of the nose, which is not naked as in most animals, but is covered with hair like the rest of the chanfrin. From the rivers of both Americas.

Mustela lutris, L.; Schreb. CXXVIII.(1) (The Sea-Otter.) Size, double that of the European species; body much elongated; tail one-third the length of the body; the hind feet very short. There is sometimes white about the head. It has only four incisors below, but the molars are like those of the other Otters. Its blackish velvet looking fur is extremely valuable, to obtain which the English and Russians hunt the animal throughout the northern parts of the Pacific ocean.

In the second subdivision of the Digitigrada there are two flat tuberculous teeth, behind the superior carnivorus tooth, which is itself furnished with a large heel. They are carnivorous, but do not exhibit a courage proportioned to their powers, and frequently feed on carrion. The cæcum is always small.

Canis, Lin.

Dogs have three false molars above, four below, and two tuberculous teeth behind each of the carnivori; the first of these upper tuberculous teeth is very large. Their superior carnivorus has only a small inner tubercle, but the posterior portion of the inferior

(1) This figure, apparently drawn from a badly prepared specimen, presents an exaggerated resemblance to the Seal, a circumstance by which some naturalists have been induced to believe it should be placed near that genus—its whole organization, however, is that of the Otter. *See Ev. Home, Phil. Trans.* 1796.

is altogether tuberculous. The tongue is soft; the fore-feet have five toes, and the hind ones four.

C. familiaris, L. (The Domestic Dog.) Distinguished by his recurved tail, otherwise varying infinitely, as to size, form, colour and quality of the hair. He is the most complete, singular and useful conquest ever made by man; the whole species has become his property; each individual is devoted to his particular master, assumes his manners, knows and defends his possessions, and remains his true and faithful friend till death—and all this, neither from constraint nor want, but solely from the purest gratitude and the truest friendship. The swiftness, strength and scent of the Dog have rendered him Man's powerful ally against all other animals, and were even, perhaps, necessary to the establishment of society. Of all animals, he is the only one which has followed Man through every region of the globe.

Some naturalists think the Dog is a Wolf, and others that he is a domesticated Jackal, and yet those dogs which have become wild again in desert islands resemble neither the one nor the other. The wild dogs, and those that belong to savages, such as the inhabitants of New Holland, have straight ears, which has occasioned a belief that the European races, which approach the most to the original type, are the *Shepherd's Dog* and *Wolf Dog;* but the comparison of the crania indicates a closer affinity in the Mastiff and Danish Dog, subsequently to which come the *Hound*, the *Pointer*, and the *Terrier*, differing between themselves only in size and the proportions of the limbs. The *Greyhound* is longer and more lank, its frontal sinuses are smaller, and its scent weaker. The *Shepherd's Dog* and the *Wolf Dog* resume the straight ears of the wild ones, but with a greater cerebral development, which continues to increase together with the intelligence in the *Barbet* and the *Spaniel.* The *Bull Dog*, on the other hand, is remarkable for the shortness and strength of his jaws. The small pet-dogs, the *Pugs*, *Spaniels*, *Shocks*, &c. are the most degenerate productions, and exhibit the most striking marks of that power to which man subjects all nature.(1)

The dog is born with his eyes closed; he opens them on the tenth or twelfth day; his teeth commence changing in the fourth month, and his full growth is attained at the expiration of the second year. The period of gestation is sixty-three days, and from six to twelve pups are produced at a birth. The dog is

(1) See Fr. Cuv. Ann. Mus. XVIII, p.333 et seq.

old at fifteen years, and seldom lives beyond twenty. His vigilance, bark, singular mode of copulation, and susceptibility of education are well known to every one.

C. lupus, L.; Buff. VII, i. (The Wolf.) A large species, with a straight tail; legs fawn-coloured, with a black stripe on the fore-legs when adult;(1) the most mischievous of all the carnaria of Europe. It is found from Egypt to Lapland, and appears to have passed into America. Towards the north, in winter, its fur becomes white. It attacks all our animals, yet does not exhibit a courage proportioned to its strength. It often feeds on carrion. Its habits and physical development are closely related to those of the dog.

C. lycaon, L.; Buff. IX, xli. (The Black Wolf.) Also inhabits Europe, and is sometimes, though rarely, found in France.(2) The fur is of a deep and uniform black, with a little white at the end of the muzzle, and a small spot of the same colour under the breast. It is said to be more ferocious than the common wolf.

C. mexicanus, L. (The Mexican Wolf.) Reddish grey, mixed with black; circumference of the muzzle, under part of the body and the feet white; size that of the Common Wolf.(3)

C. jubatus, Cuv.; *Agoura-Gouazou*, Azzar. (The Red Wolf.) A fine cinnamon-red; a short black mane along the spine. From the marshes of South America.

C. aureus, L.; Schreb. XCIV. (The Chacal or Jackal.) Less than the preceding; the muzzle more pointed; of a greyish brown; thighs and legs of a light fawn colour; some red on the ear; the tail scarcely reaching further than the heel. It is a voracious animal, which hunts like the Dog, and in its conformation and the facility with which it is tamed, resembles the latter more closely than any other wild species. Jackals are found from the Indies and the environs of the Caspian sea, as far as, and in Guinea; it is not certain, however, that they are

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(1) This stripe is more or less strongly marked on the Jackal, Mexican Wolf, &c.

(2) We have seen four individuals taken and killed in France. It must not be confounded with the Black Fox, among whose synonymes Gmelin has placed it. [*See Append. VI of Am. Ed.*]

(3) This character is taken from a specimen brought from Mexico, and presented to the Cabinet du Roi by M. de Humboldt. Those which have been drawn by authors from the bad figure of Recchi inserted in Hernandez, p. 479, must be rejected. Messrs Say and Harlan, Faun. Amer., mention two other species of Wolves, *Can. latrans* and *Can. nubilus*, which require to be examined and compared. [*See Append ut sup. of Am Ed.*]

all of one species. Those of Senegal for instance, *C. anthus*, Fr. Cuv. Mammif., stand higher, appear to have a sharper muzzle, and the tail a little longer.

Foxes may be distinguished from the Wolf and Dog by a longer and more tufted tail, by a more pointed muzzle, by pupils, which, during the day, form a vertical fissure, and by the upper incisors being less sloping. They diffuse a fetid odour, dig burrows, and attack none but the weaker animals. This subgenus is more numerous than the preceding one.

C. vulpes, L.; Buff. VII, vi. (The Common Fox.) More or less red; tip of the tail white; found from Sweden to Egypt. Those of the north have merely a more brilliant fur. There is no constant difference to be observed between those of the Eastern continent and those of North America. The *C. alopex*, Schreb. XCI, or the *Collier*, which has the end of the tail black, and is found in the same countries as the common one; the *Renard croisé*, Id. XCI, A, or the *Cross Fox*, which is only distinguished by a streak of black along the spine and across the shoulders; the Fox the French furriers call the *Turk*, which is of a yellowish grey, with the end of the tail white, are, perhaps, mere varieties of the common one. The following species however are very distinct. [See App. VII of Am. Ed.]

C. Azaræ, Pr. Max.; *Aguarachai*, Azz. (The Brazil Fox.) Grey; sides of the neck reddish; a black line commencing on the nape of the neck, and extending along the middle of the tail.

C. corsac, Gm.; Buff. Supp. III, xvi, under the name of *Adive*. (The Corsac.) A pale yellowish grey; a few blackish waves at the base of the tail; tip of the tail black; jaw white. Common on the vast heaths of central Asia, from the Volga to India. It has the habits of the Fox, and never drinks. I suspect the *Abouhossein* of Nubia—*Canis pallidus*, Ruppel, pl. xi—is the same animal.

There is also in the prairies of North America, a little Fox, *C. velox*, Har. and Say; F. Am., 91, which lives in burrows, but which appears to differ from the Corsac by the colours: a blackish tail, &c.

C. cinereo-argenteus, Schreb. XCII, A. (The Tri-coloured Fox of America.) Ash-coloured above; white beneath; a cinnamon-red band along the flanks. From all the warm and temperate parts of the two Americas.

C. argentatus. (The Silver or Black Fox.)(1) Black; tips

(1) Gmel. has confounded it with the Black Wolf, under the name of *Canis lycaon*.

of the hairs white, except on the ears, shoulders, and tail, where they are of a pure black. The end of the tail is all white. From North America. Its fur is most beautiful, and very costly.

C. lagopus, L.; Schreb. XCIII. (The Blue Fox or Isatis.) Deep ash-colour; the under surface of the toes hairy;(1) often white in winter. From the north of both continents, particularly from Norway and Siberia; much esteemed for its fur.

C. mesomelas,(2) Schreb. XCV. (The Cape Fox.) Fawn-coloured on the flanks; middle of the nose black, mixed with white, terminating in a point behind; the ears red as well as the feet; the two posterior thirds of the tail black, &c.

The interior of Africa produces Foxes remarkable for the size of their ears, and the strength of the hairs of their mustachios; they are the Megalotis of Illiger. There are two known, the

C. megalotis, Lalande; a Cape species, something smaller than our common Fox, higher on its feet; yellowish grey above, whitish beneath; the feet, tail and a dorsal line black.

C. zerda, Gm., or *Fennec* of Bruce; Buff. Supp. III, xix. Ears still larger; a small species of an almost white fawn colour, which burrows in the sands of Nubia;(3) its hair is woolly, and extends under the toes.

Finally, we may place after the Dogs, as a fourth subgenus, distinguished by the number of toes, which is four to each foot, the

Hyæna venatica, Bursch.; *H. picta*, Temm., An. Gen. des Sc. Phys. III. (The Wild Dog of the Cape.) It has the dental system of the Dog and not that of the Hyena; a long and thin form; the fur mottled, with white and fawn colour, grey and black; size of the Wolf, large ears with black tips, &c. It is gregarious, and frequently approaches Cape Town, devastating its environs.

Viverra.

The Civets have three false molars above and four below, the anterior of which sometimes fall out; two tolerably large tuberculous teeth above, one only below, and two tubercles projecting forwards on the inner side of the inferior carnivorus, the rest of that tooth

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(1) Several of the Foxes, and even the common one, have hair under their feet in the north.

(2) Gmelin has confounded it with the *adive* of Buffon, which is a factitious species, and does not differ from the Jackal.

(3) Bruce's figure, copied by Buffon, and subsequently by all his compilers, greatly exaggerates the size of the ears. We have at last a good figure and exact description of this animal in the Voy. of Ruppel, Zoolog. pl. iii.

being more or less tuberculous. The tongue is bristled with sharp and rough papillæ. Their claws are more or less raised as they walk, and near the anus is a pouch more or less deep, where an unctuous and frequently an odorous matter oozes from peculiar glands. They are divided into four subgenera.

Viverra, Cuv.

In the true Civets the deep pouch situated between the anus and the organ of generation, and divided into two sacs, is filled with an abundant pommade of a strong musky odour, secreted by glands which surround the pouch. This substance is an article of commerce, and is used by the perfumers. It was more employed when musk and ambergrease were unknown. The pupil of the eye remains round during the day, and their claws are only semi-retractile.

V. civetta, L.; Buff. IX, xxxiv. (The Civet.) Ash-coloured, irregularly barred and spotted with black; the tail less than the body, black towards the end, with four or five rings near its base; two black bands encircling the throat, and one surrounding the face; a mane along the whole length of the spine and tail that bristles up at the will of the animal. From the hottest parts of Africa.

V. zibetha, L.; Buff. IX, xxxi. (The Zibet.) Ash-coloured, spotted with black; black half-rings on the whole tail; black bands on the sides of the neck; no mane. From the East Indies.

Genetta, Cuv.

In the Genets the pouch is reduced to a slight depression formed by the projection of the glands, and has scarcely any visible excretion, although an odour is diffused from it that is very perceptible. In the light the pupil forms a vertical fissure, and the nails are completely retractile, as in the Cat.

V. genetta, L. (The Common Genet.) Grey, spotted with brown or black, the muzzle blackish; white spots on the eyebrows, cheeks and each side of the end of the nose; tail the length of the body, annulated with black and white, the black rings being from nine to eleven in number. Found from the south of France to the Cape of Good Hope, differing in the size and number of the spots in the bands along the shoulder and neck, as well as in the lines on the nape of the neck, &c.(1) It

(1) The best figure of a Genet is that given by Pennant, Synops. No. 172, Hist. No. 280, under the improper name of *Fossane*. It is the variety most fre-

frequents the edges of brooks, near springs, &c. The skin forms an important article of trade.

V. linsang, Hardwick, Lin. Trans. XIII, pl. xxiv; *Felis gracilis*, Horsf. Java. (The Javanese Genet.) Several irregular, brown, transverse bands on the body, and seven rings round the tail.

V. fossa, Buff. XIII, xx. (The Fossane of Madagascar.) Tail, flanks, and all above fawn colour; the legs and all beneath a yellowish white; reddish brown spots, those on the back forming four longitudinal bands; tail semi-annulated with red, and only half the length of the body.(1)

V. rasse, Horsf. Jav. (The Rasse.) Legs brown; body greyish brown, with small brown spots united on the crupper, and forming five longitudinal lines. Tail shorter than the body, annulated with black and white, the black rings six or seven in number.(2) The hair is harsher than in the preceding species. The

Paradoxurus, Fr. Cuv.

Has the teeth and most of the characters of the Genets, with which it was a long time confounded; it is however more stout-limbed; the feet are semi-palmate, and the walk nearly plantigrade, but what particularly distinguishes it is the spiral inclination of the tail, which is not prehensile. Only one species is known, the

P. typus, Fr. Cuv. (The Pougouné of India.) A yellowish-brown, with some spots of a deeper brown than the rest; the feet, muzzle and part of the tail blackish; eye-brows white, and

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quently brought from the Cape. There is another taken from a young specimen, Brown, Ill. pl. xliii, still under the name of *Fossane*. It is distinguished by its whitish and not brown legs, and we have seen a similar one from Senegal. That of Buff. IX, xxxvi, has not the bands on the neck and shoulders sufficiently marked. The number of black rings on the tail varies from nine to eleven. The Civette de Malacca of Sonnerat, Voy. II, pl. xxxix, which is the same as the Genette du Cap, Buff. Supp. VII, pl. lviii, and the *Chat bisaam* of Vosmaer, of which Gmelin has made as many species, appear to be common Genets.

(1) Description taken from the original sent to Buffon by Poivre, and engraved, Hist. Nat. XIII, pl. xx. The description of Daubenton is correct so far as regards the distribution of the spots; but he calls them *black*, whereas they are *reddish*. Besides, this animal can hardly be the *fossa* of Flacourt, which that author states is the size of the Badger. The *Fossane* has the same furrow as the Genet, notwithstanding the assertion of Poivre to the contrary.

(2) It is probably *l'animal du musc* of La Peyronie, Acad. des Sc. 1728, pl. xxiv, p. 464, which had been confounded with the *Zibeth*—but that animal is larger, and has other colours. To this division we must refer the *Viv. fasciata*, Gm.; Buff. Supp. VII, lvii.

a white spot under the eye. The French of Pondicherry call it the *Palm Martin* or *Marte des palmiers.*(1)

MANGUSTA, Cuv.—HERPESTES, Illig.

The pouch voluminous and simple; the anus pierced in its depth. The hairs are annulated with light and obscure tints, which determine their general colour on the eye.

The Mangouste of Egypt, so celebrated among the ancients under the name of *Ichneumon; Viverra ichneumon*, L.; Buff. Supp. III, xxvi, is grey, with a long tail terminated with a black tuft; it is larger than our Cat, and as slender as a Marten. It chiefly hunts for the eggs of the Crocodile, but also feeds on all sorts of small animals; brought up in houses, it hunts Mice, Reptiles, &c. By the Europeans at Cairo it is called *Pharaoh's Rat;* by the natives, *Nems.* The ancient tradition of its jumping down the throat of the Crocodile to destroy it, is entirely fabulous.

The Mangouste of India; Viv. mungos, Lin.; Buff. XIII, xix, and that of the Cape, *Viv. cafra*, Gm.; Schreb. CXVI, B, are smaller, both having a pointed tail, and a grey or brown fur, the latter being more of an ashy, and the former more of a fawn colour, having besides some red about the cheeks and jaws.

The Mangouste of India is celebrated for its combats with the most dangerous serpents, and for having led us to the knowledge of the *Ophiorhiza mongos* as an antidote to their poison.

There is also the Mangouste of Java—*H. Javanicus*, reddish brown; cheeks of a chesnut-red; throat more fawn coloured: a large one from the marshes of the Cape—*H. paludinosus*, of an almost uniform reddish-brown, verging to a black, a little lighter on the chin: a third from the Cape—*H. penicillatus*, of a greyish fawn colour, tip of the tail white: one from Senegal—*H. albicaudus*, grey, tail all white: it is difficult, however, to establish very specific differences between these animals.

RYZÆNA, Illig.

The Surikates have a strong resemblance to the Mangoustes, even to the tints and transverse streaks of the hair, but are distinguished from them and from all the Carnivora of which we have hitherto spoken, by having only four toes to each foot. They also are higher

(1) It is the pretended *Genette de France* of Buffon, Supp. III, pl. xlvii, the *Civette à bandeau* of Geoff.

on their legs, and they have not the small molar immediately behind the canine tooth. Their pouch extends into the anus.

One species only is known, a native of Africa—*Viv. tetradactyla*, Gm.; Buff. XIII, viii, a little less than the Mangouste of India.(1)

Crossarchus, Fred. Cuv.

The muzzle, teeth, pouch, and walk of the Surikates, the toes and genital organs of the Mangoustes.

One species only is known—*Crossarchus obscurus*, Fred. Cuv., from Sierra Leone, of the size of the Surikate; greyish brown; cheeks a little paler, and a hairy tail.

We should here mention a singular animal from the south of Africa, known only while young, which, to the five anterior toes, and the four hind ones, and the slightly elongated head of the Civets, adds the raised feet, the short hind ones, and the mane of the Hyena; it also singularly resembles the striped Hyena in the colours of its fur. The thumb of the fore foot is short and higher; it is the *Proteles Lalandii*, Isid. Geoff. Mem. du Mus. XI, 354, pl. xx. Inhabits caverns.

The individual specimens that have been examined, and which were all young, had but three small false molars, and one small tuberculous posterior molar. It seems as though their teeth had never come to perfection, as often happens in the Genets.(2)

The last subdivision of the Digitigrada has no small teeth of any kind behind the large molar of the lower jaw. The animals contained in it are the most cruel and sanguinary of the class. They form two genera.

Hyæna, Storr.

The Hyenas have three false molars above and four below, all conical, blunt, and singularly large; their superior carnivorous tooth has a small tubercle within and in front, but the inferior has none, presenting only two stout trenchant points: with these powerful arms they are enabled to crush the bones of the largest prey. The tongue is rough, each foot has four toes like that of the Surikate, and under the anus is a deep and glandular pouch, which induced some of the ancients to consider them as hermaphrodites. So powerful are the muscles of the neck and jaw, that it is almost

(1) The *Zénik* of Sonnerat, Voy. II, pl. xcii, appears to differ from the Surikate merely because it is roughly drawn.

(2) See my Ossemens Fossiles, tom. IV, p. 388.

impossible to wrest any thing from between their teeth that they have once seized, and, among the Arabs, their name is the symbol of obstinacy. It sometimes happens that an anchylosis of the cervical vertebræ is the consequence of these violent efforts, and this has caused it to be said that they have only one single bone in the neck. They are nocturnal animals, inhabiting caves; are extremely voracious, and feed chiefly on dead bodies, which they seek for even in the grave. A thousand superstitious traditions are connected with them. Three species are known, the

H. vulgaris, Buff. Supp. III, xlvi. (The Striped Hyena.) Grey; blackish or brown stripes crosswise; a mane along the whole of the nape of the neck, and black, that stands erect when the animal is angry. It is found from India to Abyssinia and Senegal.

H. brunnea, Thunb., Acad. of Stockh. 1820, part I, pl. ii; *H. villosa*, Smith. Lin. Trans. XV, pl. xix. (The Brown Hyena.) Of a deep greyish brown; black stripes on the legs only. From the south of Africa, where the inhabitants of the Cape call it *le Loup du rivage*, or *the Shore Wolf*.

H. crocuta, Schreb. XCVI, B. (The Spotted Hyena.) Grey or reddish, sprinkled with black spots. It is likewise from the south of Africa, and is the *Tiger Wolf* of the Cape.

There have lately been found in several caverns of France, Germany, and England, many bones of a lost species of Hyena —*H. spelæa*, which appears to have resided there, and to have left the bones of many other animals, which bear evident marks of its teeth, and even its own feces.(1)

Felis, Lin.

Of all the Carnaria the Cats are the most completely and powerfully armed. Their short and round muzzle, short jaws, and particularly their retractile nails, which, being raised perpendicularly, and hidden between the toes, when at rest, by the action of elastic ligament, lose neither point nor edge, render them most formidable animals, the larger species especially. They have two false molars above, and two below: their superior carnivorous tooth has three lobes, and a blunted heel on the inner side, the inferior, two pointed and trenchant lobes, without any heel: they have but a very small tuberculous tooth above, without any thing to correspond to it below. The species of this genus are very numerous and various with regard to size and colour, though they are all similar with re-

(1) See Buckland, Reliquiæ Diluvianæ, and Vol. IV of my Oss. Foss. 2d ed.

spect to form. We can only subdivide them by referring to the difference of size and the length of the hair, characters of but little importance.

At the head of the genus we find

F. leo, L.; Buff. VIII, i, 11. (The Lion.) Distinguished by its uniform tawny colour, the tuft of hair at the end of the tail, and the flowing mane which clothes the head, neck, and shoulders of the male. Of all beasts of prey, this is the strongest and most courageous. Formerly scattered through the three parts of the old world, it seems at present to be confined to Africa and some of the neighbouring parts of Asia. The head of the Lion is more square than that of the following species.

Tigers are large, short haired species, most commonly marked with vivid spots.

F. tigris, Buff. VIII, ix. (The Royal Tiger.) As large as the Lion, but the body is longer, and the head rounder; of a lively fawn colour above; a pure white below, irregularly crossed with black stripes; the most cruel of all quadrupeds, and the scourge of the East Indies. Such are his strength and the velocity of his movements, that during the march of armies he has been seen to seize a soldier while on horseback, and bear him to the depths of the forest, without affording a possibility of rescue.

F. onça, L.; Azzar. pl. ix; Fred. Cuv. Mammif. (The Jaguar.) Nearly the size of the Royal Tiger, and almost as dangerous; a lively fawn colour above; the flank longitudinally marked with four rows of ocellated spots, that is, with rings more or less complete, having a black point in the middle; white beneath, transversely striped with black. Sometimes individual specimens are found black, whose rings, of a deeper hue, are only perceptible in a particular light.

F. pardus, L.; the *Pardalis* of the ancients; Cuv. Ménag. du Mus. 8vo, I, p. 212. (The Panther.) Fawn coloured above; white beneath; with six or seven rows of black spots, resembling roses, that is, formed by the assemblage of five or six simple spots on each flank; the tail is the length of the body, minus that of the head.

This species is scattered throughout all Africa, the southern parts of Asia, and the Indian Archipelago.

In some of them the ground of the fur is black, with spots of a deeper black—*F. melas*, Pér., but they are not a distinct species. We have frequently seen black and fawn coloured young ones suckled by the same mother.(1)

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(1) Temminck calls this species *Felis leopardus*.

F. leopardus, L. (The Leopard.) From Africa; similar to the Panther, but has ten rows of smaller spots.(1)

These two species are smaller than the Jaguar. Travellers and furriers designate them indiscriminately by the names of *Leopard*, *Panther*, *African Tiger*, &c.(2)

There is a third, peculiar to the distant parts of the East Indies, that is a little lower; tail equal in length to the body and head; spots smaller and more numerous; the *F. chalybeata*, Herm.; Schreb. CI.(3)

F. discolor, L.; Buff. VIII, xix. (The Couguar or Puma.) Red, with small spots of a slightly deeper red which are not easily perceived. From both Americas, where it preys on Sheep, Deer, &c.(4)

Among the inferior species, we should distinguish the Lynxes, which are remarkable for the pencils of hair which ornament their ears.

Four or five different kinds of them are known in commerce by the name of *Loups Cerviers*, which have long been confounded by naturalists, (*Felis lynx*, L.) and whose specific limits are even not yet perhaps well ascertained. They all have a very short tail, and a skin more or less spotted.

The most beautiful, which are as large as a Wolf—*F. cervaria*, Temm., come from Asia by the way of Russia, and have a slightly reddish-grey fur, finely spotted with black.

Others from Canada and the north of Sweden—*F. borealis*,

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(1) The same naturalist considers our Leopard as a variety of our Panther, and confounds them under his *Felis leopardus*.

(2) Buffon has mistaken the Jaguar, which he took for the Panther of the eastern continent, and has not well distinguished the Panther and the Leopard, and for this reason we cannot positively quote his pl. xi, xii, xiii and xiv of Vol. VIII.

(3) It is to this species that Temminck affixes the name of *Panther*, because he thinks Linnæus alluded to it, when speaking of his *Felis pardus* in the "*cauda elongata.*" There is one thing very certain, and that is, that the Panther, so well known to the ancients, and which was so often produced at the Roman games, could not possibly have been an animal from the extreme parts of oriental Asia.

The *Once* of Buff. IX, pl. xiii, (*Felis uncia*, Gm.) differs from the Panthers and Leopards by the inequality of the spots, which are more irregularly distributed, and partly crenate or annulated, &c. It appears to be found in Persia. We only know it by the figure of Buffon, and that which Mr Hamilton Smith has inserted in the work of Griffith, taken from a specimen that was living in London.

(4) That this animal, our common Panther, does not always confine itself to Sheep, &c., is well known, and has lately been proved, January 1830, by an unprovoked attack upon an unfortunate woman in Pennsylvania. The ferocious brute seized upon her as she was passing along the road, and killed her in an instant. See Griff. part V, p. 438. *Am. Ed.*

Temm., have the fur very much tufted, extending even under the feet; of an ash-coloured grey, and with scarcely any spots.

The Lynx of the temperate parts of Europe—*F. lynx*, Temm., which has almost disappeared from its populous districts, but which is still found in the Pyrenees, in the mountains of Naples, and, as it is said, even in Africa; has a red fur, spotted with brown.

In these three species or varieties, the end of the tail is black. It is thought there is a Lynx of the south of Europe—*Felis pardina*, Oken, which may be considered distinct. It is smaller, not so hairy, fur red mottled with black, and the tail spotted like the body.

We find also in North America the

F. rufa, Güld. Schreb., CIX, B; *F. montana*, L. (The Bay Lynx.) A reddish fawn or greyish colour, mottled with brown; brown waves on the thighs; tail annulated with black or brown; rather smaller than the Lynx.(1)

F. chaus, Güld.; Schreb. CX. (The Chaus, or Lynx of the Marshes.) Is of a yellowish grey-brown; the hind part of each leg blackish; tail reaches to the hamstrings, and is annulated at the extremity with black. Inhabits the Caucasian marshes, those of Persia and of Egypt, pursues Birds, &c.

It is now thought we should separate from the above species the Booted Lynx—*F. caligata*, Temm., Bruce, pl. xxx, which is somewhat smaller, and has a little longer tail; the external surface of its ears is red. It is, at least, a closely allied species, and has the same habits.

F. caracal, L.; Buff. IX, xxiv, and Supp. III, xlv. (The Caracal.) Of an almost uniform vinous red. From Persia, Turkey, &c. It is the true Lynx of the ancients.

The inferior species, which are deprived of the pencils on the ears, are more or less similar to our common Cat; such are

F. pardalis, L.; Buff. XIII, pl. xxxv and xxxvi. (The Ocelot.) Rather lower on its legs than most of the others; grey, with large fawn coloured spots bordered with black, forming oblique bands on the flank. From America.

F. mitis, Fr. Cuv. (The Chati.) Marked with unconnected, triangular, fawn coloured spots, edged with black.

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(1) M. Rafinesque also indicates a *Lynx fasciatus*, a *L. aureus*, a *L. floridanus*, a *L. montanus*, and M. Temminck a *Felis aurata*, which must all belong to this little tribe.

N.B. They are most probably all one species. *Am. Ed.*

F. cafra. (The Cat of Caffraria.) Stands high on its legs; grey, transversely striped with black.

F. serval, Buff. XIII, xxxv. (The Serval.) Yellowish, with irregular black spots. From Africa.

F. jaguarondi, Azzara, Voy. pl. 9. (The Jaguarondi.) Body long; and altogether of a blackish brown. From the forests of South America.

F. catus, L.; Buff. VI, i, et seq. (The Domestic Cat.) Is originally from the forests of Europe. In its wild state, it is of a greyish brown, with darker transverse undulations; below pale; the insides of the thighs and of all the feet, yellowish; three bands on the tail, its inferior third blackish. In a domestic state it varies, as is well known, in colours, in the length and fineness of the hair, but infinitely less so than the Dog; it is also much less submissive and affectionate.(1)

We might also place in a separate subgenus, a species whose head is rounder and shorter, and whose nails are not retractile, the *Felis jubata*, Schreb. 105, and better, *Fel. guttata*, Id. 105, b, (The Hunting Leopard) which is the size of the Leopard, but longer bodied, and stands higher; the tail long, annulated at the end; the fur fawn colour, mottled with small uniform black spots, a black streak reaching from the eye to the angle of the mouth. The disposition of this animal differs from that of the remainder of the genus in being extremely mild and docile. The

AMPHIBIA

Will form the third and last of the small tribes into which we divide the Carnivora. Their feet are so short and so enveloped in the skin, that the only service they can render them on land, is to enable them to crawl; but as the intervals of the fingers are occupied by membranes, they are excellent oars; and in fact, these animals pass the greater portion of their time in the water; never landing, except for the purpose of basking in the sun, and suckling their young. Their

(1) The species, more or less allied to the Cat, are very numerous in the two continents; but all those that are given in catalogues are very far from being authentic, and sufficiently distinguished from each other. We may, however, consider as such, those of which we have good figures. The *Margay*, Buff.; *Felis tigrina*, Gm., Buff. XIII; Schreb. 106.—*Fel. macroura*, Pr. Max., Brazil, pl. xi.—*Felis sumatrana*, Horsf.—*Fel. javanensis*, Id.—*Fel. torquata*, Fred. Cuv.—*Fel. colocolo*, Fred. Cuv. Mammif., &c.

elongated body; their very movable spine, which is provided with muscles that strongly flex it; their narrow pelvis; their short hair, that adheres closely to the skin, all unite to render them good swimmers; and all the details of their anatomy confirm these first indicia.

We have as yet distinguished two genera only, Phoca and Trichechus.

Phoca, Lin.

Seals have six or four incisors above, four or two below, pointed canini and grinders to the number of twenty, twenty-two, or twenty-four, all trenchant or conical, and without any tuberculous part whatever; five toes to all the feet, the anterior ones regularly decreasing in length from the thumb to the little toe, while in the hinder feet the thumb and the little toe are the longest, and the intermediate ones the shortest. The fore feet are enveloped in the skin of the body as far as the tarsus, the hinder ones almost to the heel. Between the latter is a short tail. The head of a Seal bears a resemblance to that of a Dog, whose intelligence and soft expressive look it also possesses. It is easily tamed, and soon becomes attached to its keeper, or those who feed it. The tongue is smooth, and sloped at the end, the stomach simple, cæcum short, and the intestinal canal long, and tolerably regular. These animals live on fish; always eat in the water, and close their nostrils when they dive by a kind of valve. As they remain a long time under water, it was supposed that the foramen ovale remained open, as in the human fœtus—but it is not so: there is, however, a large venous sinus in the liver, which must assist them in diving by rendering respiration less necessary to the motion of the blood. Their blood is very abundant and very black.

Phoca, properly so called, or *without external ears.*

The true Phocæ have pointed incisors; all the toes enjoy a certain degree of motion, and are terminated by pointed nails planted on the edge of the membrane, which unites them.

They are subdivided, from the number of their incisors. The Calocephala, Fr. Cuv. have six above and four below; such is the

Phoca vitulina, L.; Buff. XIII, xlv, and Supp. VI, xlvi; *Ph. littorea*, Thienem. pl. vi. (The Common Seal.) From three to five feet in length; of a yellowish grey, more or less shaded and spotted with brown, according to its age; sometimes brownish, with small yellow spots. When very old it becomes whitish. Common on the coast of Europe in great herds. It is also found far to the north; we are even assured that it is this

species which inhabits the Caspian sea, and the great fresh water lakes of Russia and Siberia, but this assertion does not appear to be founded on an exact comparison. In fact, the European seas contain several Phocæ, which have long been confounded, some of which are perhaps mere varieties of the others.

Thus, some of them have the back covered with small clouded, confluent, brownish spots, on a yellowish ground—*Ph. hispida*, Schreb. 86.(1) These are the most common ones of the northern ocean. In others again the ground is dark, traversed with undulating lines, which sometimes form rings—*Ph. annellata*, Nils., Thienem. pl. ix—xii; *Ph. fœtida*, Fabr.(2), &c.

A species more easily recognised is the

Ph. groenlandica, and *P. oceanica;* Eged. Groenl. fig. A, p. 62; Lepechin, Act. Petrop. I, part I, pl. vi—vii.; Thieneman, pl. xiv—xxi. (The Harp Seal.) Yellowish grey, spotted with brown when young, afterwards marked by an oblique black or brown scarf on each flank; the head of the *old* male is black; length five feet. From the whole north of the globe.

Ph. barbata, Fabr.; Thienem. pl. i—iv. (The Bearded Seal.) From the North, and surpasses all the preceding ones in its size, which is from seven to eight feet; it is grey; browner above, with a longitudinal blackish line that forms a sort of cross upon the chanfrin. Its mustachios are thicker and stronger than the others.

Ph. leucopla, Thienem. pl. xiii. (The White-nailed Seal.) Is of a yellowish grey.

Ph. lagura, Cuv. (The Hare-tailed Seal.) Has the tail white and woolly, &c.(3)

Stenorhincus, Fred. Cuv.

Four incisors above, and four below, the molars deeply notched into three points.

One species only is known, and that is from the Austral seas —*Ph. leptonix*, Blain. Size of the barbata; greyish above; yellowish beneath; nails small.

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(1) I suspect we should refer to it the *Ph. scopulicola*, Thienem. pl. v.

(2) It is one of those represented by Fr. Cuv. under the name of "*Phoque commun.*"

(3) I only wish to mention those species which I consider sufficiently ascertained. The long catalogues of the Phocæ, recently published, seem to me to multiply them a great deal too much.

PELAGUS, Fred. Cuv.

Four incisors also, above and below, but their grinders are obtuse cones, with a slightly marked heel before and behind. There is one of them in the Mediterranean.

Ph. monachus, Gm.; Buff. Supp. VI, pl. xiii.(1) (The Monk.) From ten to twelve feet in length, of a blackish brown, with a white belly. It is particularly found among the Grecian and Adriatic Islands, and is, most probably, the species best known to the ancients.

STEMMATOPUS, Fred. Cuv.

Four superior incisors, and two inferior; grinders compressed, slightly trilobate, supported by thick roots. Such is the

Ph. cristata, Gm.; *Phoca leonina*, Fabr.; Eged. Groenl. pl. vi; ¡Dekay, New York Lyc. I, pl. vii. (The Hooded Seal.) Seven or eight feet long; a piece of loose skin on the head, which can be inflated at the pleasure of the animal, and is drawn over the eyes when it is menaced, at which times the nostrils also are inflated like bladders. From the arctic ocean.(2)

Finally, the MACRORHINUS, Fr. Cuv., has the incisors of the preceding, obtuse conical molars, and the muzzle resembling a short movable proboscis or snout. The largest seal known is of this subgenus; the

Ph. leonina, L.; *Sea-Lion* of Anson; *Sea-Wolf* of Pernetty, &c. Peron's Voy. I, xxxii. (The Elephant Seal.) From twenty to twenty-five feet in length; brown, the muzzle of the male terminated by a wrinkled snout, which becomes inflated when the animal is angry. It is common in the southern latitudes of the Pacific Ocean, at the Terra-del-Fuego, New Zealand, Chili, &c. It constitutes an important object of the fisheries, on account of the oil in which it abounds. The

OTARIES, Péron. *Seals with external ears*

Are worthy of being formed into a separate genus; because, independently of the projecting external ears, the four superior middle incisors have a double cutting edge, a circumstance hitherto un-

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(1) It is the same individual described by Hermann, Soc. des Nat. de Berl. IV, xii, xiii, under the name of *monarchus*.

(2) The mechanism by which this inflation is effected is not yet well understood. See Dekay and Ludlow, Annals of the New York Lyceum, Vol. I, pp. 94 and 99.

known in any animal; the external ones are simple and smaller, and the four inferior bifurcated. All the molars are simply conical, and the toes of the fore feet almost immovable; the membrane of the hind feet is lengthened out into a slip beyond each toe; all the nails are flat and slender.

Ph. jubata, Gm.; *Sea-Lion* of Steller, Pernetty, &c.; Buff. Supp. VII, xlviii. From fifteen to twenty feet, and more, in length; fawn coloured; the neck of the male covered with hairs that are more frizzled and thickly set than those on the rest of the body. It might be said to be found in all the Pacific Ocean, were it not that those from the straits of Magellan seem to differ from such as are taken at the Aleutian islands.

Ph. ursina, Gm.; Buff. Supp. VII, xlvii. (The Sea Bear.) Eight feet long, no mane, varying from brown to whitish. From the north of the Pacific Ocean. Other Seals are found in that sea which only differ from the ursina in size and colour: such is the *Petit phoque noir* of Buffon (*Ph. pusilla*), Buff. XIII, liii; the *Yellow Seal* of Shaw, &c.

Trichechus, Lin.(1)

The Morse resembles the Seal in its limbs, and the general form of the body, but differs widely from it in the teeth and head. There are no incisors nor canini in the lower jaw, which is compressed anteriorly to pass between two enormous canini or tusks, which issue from the upper one, and which project downwards, being sometimes two feet long, and of a proportionable thickness. The enormous size of the alveoli, requisite for holding such tremendous canini, raises up the whole front of the upper jaw, giving it the shape of a huge inflated jowl, the nostrils looking upwards, and not terminating the muzzle. The molars are all short, obliquely truncated cylinders; there are four of them on each side, above and below, but, at a particular age, two of the upper ones fall out. Between the canini are two incisors, similar to the molars, which most authors have not recognised as such, although they are implanted in the intermaxillary bone. Between these again, in the young animal, are two more small pointed ones.

The stomach and intestines of the Morse are very similar to those of the Seal. It appears that the *fucus* constitutes part of its food, along with animal matters. One species only is as yet ascertained, the

Trich. rosmarus, L.;(2) Buff. XIII, liv; and better, Cook,

(1) Trichechus, from τριξ (hair), a name invented by Artedi for the Sea Cow.

(2) Shaw, however, suspects that there may be two distinguished by the greater or less size of their trunks, and by their being more or less convergent.

Voy. III. (The Sea-Cow.) It inhabits the Arctic seas, surpasses the largest Ox in size, attains the length of twenty feet, and is covered with a short yellowish hair. It is sought for on account of its oil and tusks; the ivory of which, although rough grained, is employed in the arts. The skin makes excellent coach braces.(1)

ORDER IV.

MARSUPIALIA.

So many are the singularities in the economy of the Marsupialia or pouched animals, as they are termed, which we formerly placed at the end of the Carnaria as a fourth family of that great order, that it appears to us they should form a separate and distinct one, particularly as we observe in them a kind of representation of three very different orders.

The first of all their peculiarities is the premature production of their young, whose state of development at birth is scarcely comparable to that of an ordinary fœtus a few days after conception. Incapable of motion, and hardly exhibiting the germs of limbs and other external organs, these diminutive beings attach themselves to the mammæ of the mother, and remain fixed there until they have acquired a degree of development similar to that in which other animals are born. The skin of the abdomen is almost always so arranged about the mammæ as to form a pouch in which these imperfect little animals are preserved as in a second uterus; and to which, long after they can walk, they always fly for shelter at the approach of danger. Two particular bones attached to the pubis, and interposed between the muscles of the abdomen, support the pouch. These bones are also found in the male, and even in those species in which the fold that forms the pouch is scarcely visible.

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(1) Previous to my arrangement, the Lamantins and Dugongs, much more nearly allied to the Cetacea, were very improperly united with the Morses.

The matrix of the animals of this family does not open by a single orifice into the extreme end of the vagina, but communicates with this canal by two lateral tubes resembling handles. The premature birth of the young appears to depend upon this singular organization. The scrotum of the male, contrary to what obtains in other quadrupeds, hangs before the penis, which, when at rest, is directed backwards.

Another peculiarity of the Marsupialia is, that notwithstanding a general resemblance of the species to each other, so striking, that for a long time they were considered as one genus, they differ so much in the teeth, the organs of digestion and the feet, that if we rigorously adhered to these characters, we should be compelled to separate them into several orders. They carry us by insensible gradations from the Carnaria to the Rodentia, and there are even some animals which have the pelvis furnished with similar bones; but which, from the want of incisors or of all kinds of teeth, have been approximated to the Edentata, where, in fact, we shall leave them, under the name of Monotremata.

In a word, we would say that the Marsupialia form a distinct class, parallel to that of Quadrupeds, and divisible into similar orders: so that if we were to arrange these two classes into two columns; the Sarigues, the Dasyuri, and the Perameles would be opposite to the insectivorous Carnaria with long canini, such as the Tenrecs and the Moles; the Phalangers and the Potoroos, opposite to the Hedge-hogs and Shrews; the Kanguroo, properly so called, cannot be compared with any thing; but the Phascolomys should be opposite to the Rodentia. Finally, if we were to consider the bones of the pouch only, and regard as Marsupialia all the animals that possess them, the *Ornithorinci* and the *Echidnæ* would form a group parallel to that of the Edentata.

Linnæus arranged all the species he was acquainted with under his genus *Didelphis*, a word signifying double uterus. The pouch in some respects is in fact a second one.

The first subdivision of the Marsupialia is marked by long canini, and small incisors in both jaws, back molars bristled with points, and all the characters in general of the insecti-

vorous Carnaria; the animals that compose it are also perfectly similar to the latter in their regimen.

Didelphis, Lin.

The Opossums,(1) which of all the Marsupialia have been the longest known, form a genus peculiar to America. They have ten incisors above, the middle ones being rather the longest, and eight below; three anterior compressed grinders and four posterior bristled grinders, the superior ones triangular, and the inferior oblong, which, with the four canini, make in all fifty teeth, the greatest number hitherto observed in Quadrupeds. Their tongue is papillated, and their tail prehensile and partly naked. Their hinder thumb is long and very opposable to the other four toes, from which circumstance these animals are sometimes styled *Pedimana;* they have no nail. Their extremely wide mouth, and great naked ears give them a very peculiar physiognomy. The glans penis is bifurcated. They are fetid and nocturnal animals, whose gait is slow; they remain on trees, and there pursue Birds, Insects, &c., though not despising fruit. Their stomach is simple and small, their cæcum of a middling size and without any enlargements.

The females of certain species have a deep pouch in which are the mammæ, and in which they can enclose their young.

Did. virginiana, Penn. Hist. Quadr. 302.(2) (The Opossum.) Almost the size of a Cat; fur, a mixture of black and white; ears, one side black, and the other white; head nearly all white. Inhabits all America; steals at night into villages; attacks fowls, eats their eggs, &c. The young ones at birth, sometimes sixteen in number, weigh only a grain each. Although blind and nearly shapeless, they find the mammæ by instinct, and adhere to them until they have attained the size of a Mouse, which happens about the fiftieth day, at which epoch they open their eyes. They continue to return to the pouch till they are as large as Rats. The term of gestation in the uterus is but twenty-six days.(3)

Did. Azzaræ, Temm. (The Gamba, or the Great Opossum of Paraguay and Brazil.) Differs from the preceding in the

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(1) *Carigueia*, according to Marcgrave, is their Brazilian name, whence we have *Sariguoi, Cerigon, Sarigue.* They are called *Micouré* in Paraguay; *Manicou* in the islands; *Opossum* in the United States; *Thlaquatzin* in Mexico.

(2) It is the *Sarigue des Illinois*, and the *Sarigue à longs poils;* Buff. Supp. VII, p. xxxiii and xxxiv; *Did. marsupialis*, Schreb. pl. cxlv.

(3) See the letter of Dr B. S. Barton to M. Roume on the gestation of the Opossum.

black which marks the muzzle and nearly the whole of the ears; the tail is also longer.

Did. marsupialis, and *Did. cancrivora*, L.; Buff. Supp. III, liv. (The Crab-eating Opossum.) Size of the preceding; yellowish, mixed with brown, with brown hairs; a brown streak on the chanfrin. It frequents the marshes of the sea coast, where it feeds chiefly on Crabs.(1)

Did. opossum, L.; Buff. X, xlv, xlvi. (The Four-eyed Opossum.) Chesnut above, white below, a white or pale yellow spot over each eye; posterior third of the tail white; larger than a large Rat.

Other species possess no pouch, having a mere vestige of it in a fold of the skin on each side of the abdomen. They usually carry their young on their backs, the tails of the latter being entwined around that of the mother.

Did. nudicauda, Geoff.; *D. myosuros*, Temm. (The Bare-tailed Opossum.) Fawn coloured; tail very long, and naked even at its base; two whitish spots over each eye, one beneath.

Did. cayopollin,(2) *Did. philander*, and *Did. dorsigera*, L.; Buff. X, lv. (The Cayopollin.) A greyish fawn colour; the circumference of the eyes and a longitudinal band on the chanfrin brown; tail marked with black; size that of the Norway Rat. The superior third of the tail furnished with hairs.

Did. cinerea, Temm. (The Cinereous Didelphis.) A light ash colour, with blackish reflections; some red on the breast; the posterior half of the tail white; of the same size as the preceding. From Brazil.

Did. murina, L.; Buff. X, lii, liii. (The Marmose.)(3) Fawn coloured grey; a brown stripe, in the middle of which is the eye; tail immaculate; less than a Rat.

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(1) It is the pretended *Great Oriental Philander* of Seba of which Linnæus has made his *Did. marsupialis*. Buffon, who has described the male, Supp. III, pl. liii, erroneously thought the female had no pouch, which was the cause of the improper establishment of a second species, *Did. cancrivora*, Gm., *carcinophaga*, Bodd. The Crab-eater is called at Cayenne *pian*, or *puant*.

(2) *Cayopollin*, the name of a species that inhabits the mountains of Mexico; it has, somewhat arbitrarily, been applied to this species in particular.

(3) *Marmose*, a name adopted by Buffon from a typographical error in the French translation of Seba, who assures us in the text that it is called *Marmot* in Brazil. The truth is, that the Dutch, in the time of Maregrave, called it *Wood-Rat*, and the Brazilians *Taibi; Rat-de-bois* is also its name among the French at Cayenne. Seba must have rendered *Bosch-ratte* by Marmot.

N.B. There has been found, in the plaster quarries near Paris, the fossil skeleton of a *Didelphis* allied to the Marmose.

Did. brachyura, Pall., Buff. Supp. VII, lxi. (The Touan.) Black, blackish; flanks of a vivid red; belly white; tail shorter than the body. Less than a Rat. The three latter species are from South America.

Finally, there is one known with palmated feet, which must be aquatic; it is not ascertained whether or not it has a pouch —it is the

CHIRONECTES, Illig.(1)

Did. palmata, Geoff.; *Lutra memina*, Bodd.; *La petite Loutre de la Guiane*, Buff. Supp. III. xxii. Brown above, with three transverse grey bands, interrupted in the middle, and white below; larger than a Norway Rat.

All the other Marsupialia inhabit eastern countries, New Holland particularly, a land whose animal population seems chiefly to belong to this family.

THYLACINUS, Temm.(2)

The Thylacini are the largest of this first division. They are distinguished from the Opossums by the hind feet having no thumb; a hairy, non-prehensile tail, and two incisors less in each jaw; their molars are of the same number. They consequently have forty-six teeth; but the external edge of the three large ones is projecting and trenchant, almost like the carnivorous tooth of a Dog; their ears are hairy, and of a medium size. One species only is known, the

Did. cynocephala, Harris, Linn. Trans. IX, pl. xix, 1, and Ency. Method., Mammif. Supp. pl. vii, f. 3. Size that of a Wolf, but stands lower; grey; transverse black stripes on the crupper. It is very carnivorous, and pursues all small quadrupeds. From Van Dieman's Land.

PHASCOGALE, Temm.

The same number of teeth as the Thylacini, but the middle incisors are longer than the others, and the back molars more bristled, circumstances which approximate them more closely to the Sarigues. They are also allied to them by their small size; their tail however is not prehensile; their hind thumb, though very short, is still very apparent.

Did. penicillata, Shaw, Gen. Zool. I, ii, pl. 113; Schreb. CLII, B, L. Ash coloured; tail furnished with long black

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(1) *Chironectes*, i. e. swimming with hands.

(2) Thylacinus, from θυλακος purse. A species of Thylacinus has also been found in the plaster quarries of Paris.

hairs; size that of the Norway Rat: lives on the trees in New Holland, and pursues insects.

Dasyurus minimus, Geoff., Schreb. pl. 152, B. C. (The Dwarf Phascogalis.) Scarcely larger than a mouse, fur soft and reddish. From the south of Van Dieman's Land.

Dasyurus, Geoff.(1)

Two incisors and four grinders in each jaw less than the Opossums, so that they have only forty-two teeth; their tail, every where covered with long hairs, is not prehensile. The thumb of the hind foot is reduced to a tubercle, or has even totally disappeared. They are from New Holland, where they feed on insects and dead bodies; they penetrate into houses, where their voracity is very inconvenient, &c. Their mouth is not so wide, their muzzle not so pointed as those of the Opossums; their hairy ears are also shorter. They do not climb trees.

Did. ursina, Harr. Lin. Trans. IX, xix, f. 2, and Encycl., Supp. f. 6. (The Ursine Opossum.) Long rough black hairs, with some irregularly placed white spots; the tail half as long as the body, almost naked underneath. Inhabits the north of Van Dieman's Land, and is nearly the size of the Badger.

Das. macrourus, Geoff., Peron. Voy. pl. xxxiii, Schreb. CLII, B, a. (The Long-tailed Dasyurus.) Size of a Cat; tail as long as the body; fur brown, spotted with white, both on the body and tail. The tubercle of the thumb is still well marked in this species, but in the following ones it can no more be seen.

Das. Maugei, Geoff., Voy. de Freycin. Zool. pl. iv, Schreb. CLII, B, b. A kind of olive colour, spotted with white; no spot on the tail; a little smaller than the preceding.

Did. viverrina, Shaw., Gen. Zool. CXI; White, Bot. Bay, App. 285; Schreb. CLII, B, c. Black, spotted with white; no spots on the tail; a third less than the first.

Perameles, Geoff.(2)—Thylacis, Illig.

The thumb of the hind foot short, like the first Dasyuri, and the two following toes united by the membrane as far as the nails; the thumb and the little toe of their fore feet are simple tubercles, so that there seem to be but three toes. They have ten incisors above, the external ones separate and pointed, and only six below; but their molars are the same as in the Opossums, so that they have

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(1) *Dasyurus*, hairy tail. See Mem. de M. Geoff., Ann. du Mus. III, p. 353, and XV, p. 301.

(2) *Pera*, purse, *Meles*, Badger. See Mem. Geoff. Ann. du Mus. tom. IV.

forty-eight teeth. Their tail is hairy, and not prehensile. The great claws of their fore feet announce their habit of digging in the earth; and the tolerable length of their hind ones, a swiftness of gait.

P. nasutus, G., Ann. du Mus. IV. The muzzle much elongated; ears pointed; fur a greyish brown. At the first glance it resembles a Tenrec.(1)

The species belonging to the second subdivision of the Marsupialia have two broad and long incisors in the lower jaw with pointed and trenchant edges sloping forwards, and six corresponding ones in the upper jaw. Their superior canini are also long and pointed, but all their inferior ones consist of teeth so small that they are frequently hidden by the gum; they are sometimes altogether wanting in the lower jaw of the last subgenus.

Their regimen is chiefly frugivorous; consequently their intestines, the cæcum particularly, are longer than in the Opossum. The thumb is very large in all of them, and so widely separated from the toes that it seems to slant backwards almost like that of Birds. It has no nail, and the two following toes are united by the skin as far as the last phalanx. It is from this circumstance that these animals have received the name of Phalangers.(2)

Phalangista.

Phalangista, Cuv.—Balantia, Illig.(3)

The true Phalangers have not the skin of the flank extended; four back molars in each jaw, with four points in two rows; in front a large one, conical and compressed, and between it and the superior canine two small and pointed ones, to which correspond the three

(1) The *Péramèle Bougainville* of Quoy and Gaymard does not differ specifically from the nasutus. The *Peram. obesula*, Geoff. is not so authentic.

(2) The name of *Phalanger* was given by Buffon to two individuals he had observed, on account of the union of the two toes of the foot. That of *Philander* is not, as might be thought, derived from the Greek, but from the Malay word *Pélandor*, which means Rabbit, applied by the inhabitants of Amboyna to a species of Kanguroo. Seba and Brisson have used it indiscriminately for all the pouched animals. The Phalangers, in the Moluccas, are called *Couscous* or *Coussous*. The earlier travellers not having properly distinguished them from the *Sarigues*, gave cause to believe that this last genus was common to the two continents.

(3) Balantia, from Βαλάντιον, purse or pouch.

very small lower ones, of which we have just spoken. Their tail is always prehensile.

The tail in some of them is in a great measure scaly. They live on trees in the Moluccas, where they feed on Insects and fruit. At the sight of a man they suspend themselves by their tail; and if he gaze at them steadily for some time, they fall through lassitude. They diffuse a very unpleasant odour, notwithstanding which their flesh is eaten.

There are several of them known, of various sizes and colours, all of which are embraced under the *Didelphis orientalis* of Linnæus. M. Temminck thinks he can separate them into species as follows: *Ph. ursina*, T. (The Ursine Phalanger.) Nearly the size of the civet; fur close, and of a blackish-brown; the young ones a fawn-coloured brown. From the woods of the island of Macassar.

Ph. chrysorrhous, T. (The Golden-cruppered Phalanger.) Size of a large Cat; fur of an ash brown; white beneath; a golden fawn colour on the croup. From the Moluccas.

Ph. maculata, T.; Buff. XIII, pl. ii; Voy. de Freycin. pl. vii; Voy. du Duperr. pl. iv. (The Spotted Phalanger.) Size of a Cat; whitish, irregularly spotted or marbled with brown.

Ph. cavifrons, T.; Buff. pl. x, the female; and Voy. de Duperrey, the male. (The Hollow-fronted Phalanger.) The male white; the female fawn coloured, with a brown stripe along the back. To these we must add

Ph. Quoy, Voy. de Freycin. pl. vi. (The Quoy Phalanger.) A greyish-brown; a blackish-brown longitudinal band on the croup; top of the head a cinnamon-red; cheeks, throat and breast white.(1)

In others, which have hitherto been found in New Holland only, the tail is hairy to the tip.

Ph. vulpina; Did. lemurina and *vulpina*, Shaw; *Bruno* of Vicq. d'Az.; White, Voy. 278. (The Fox-like Phalanger.) Size of a stout Cat; greyish-brown, paler beneath; tail nearly all black.

Ph. Cookii, Cook's last Voy. pl. viii. (The Phalanger of Cook.) Less than a Cat; brown above, white underneath; head and flanks red; posterior third of the tail white.

Ph. Bougainvillii. (The Phalanger of Bougainville.) Size of a Squirrel; ash coloured above, white underneath; the posterior half of the tail black; posterior half of the ear white.(2)

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(1) A very distinct species.

(2) A new species brought to France by M. de Bougainville from his last expedition.

PETAURUS, Shaw.—PHALANGISTA, Illig.

The Flying Phalangers have the skin of the flanks more or less extended between the legs, like the Flying Squirrels among the Rodentia, which enables them to sustain themselves momentarily in the air, and make greater leaps. They also are only found in New Holland.

Some of the species have inferior canini, but they are very small. Their superior canini and their three first molars, above and below, are very pointed; each of their back molars has four points.(1)

Ph. pygmæa; Did. pygmæa, Shaw, Gen. Zool. pl. 114; Schreb. CXLIV, A. (The Flying Dwarf Phalanger.) Of the colour and nearly the size of a Mouse; the hairs of the tail regularly arranged on its two sides like the barbs of a quill.

Other species have no inferior canini, while the superior ones are very small. Their four back molars present four points, but they are slightly curved into a crescent, which is very nearly the form of those of the Ruminantia. In front, there are two above and one below, less complicated. By this structure they are rendered still more frugivorous than all the preceding species.

Ph. petaurus; Shaw, Gen. Zool. pl. cxii, White, Voy. 288. (The Great Flying Phalanger.) Resembles the Taguan and the Galeopithecus in size; its fur is soft and close; its tail long and flattened; brownish-black above, white beneath. They are of various shades of brown; some are variegated, and others perfectly white.

Ph. sciurea; Shaw, pl. cxiii, 3. (The Bordered Flying Phalanger.) Size of the brown Rat; ash coloured above, white beneath; a brown line commencing on the chanfrin and running along the back; edges of the lateral membrane brown; tail tufted; the length of the body and its posterior portion black. From the islands near New Guinea.

P. Peronii, Desm. (The Hairy-footed Flying Phalanger.) A reddish-grey; front of the ears and under part of the body whitish; toes very hairy and brown; tail black, longer than the body, and white at the end.

Ph. macroura; Shaw, pl. cxiii, f. 2. (The Long-tailed Flying Phalanger.) A deep brown above, white beneath; size of the brown Rat; tail slender, about half as long again as the body.

Our third subdivision has the incisors and superior canini

(1) It is of this first division that Desmarets has made his genus ACROBATE.

of the second. The two toes of the hind feet are also similarly united; but the posterior thumbs and inferior canini are wanting. It contains but a single genus.

Hypsiprymnus, Illig.(1)

The Potoroos are the last animals of this family which retain any trait of the general characters of the Carnaria. Their teeth are nearly the same as those of the Phalangers, and they still have pointed canini above. The two superior middle incisors are pointed, and longer than the others; the two inferior ones project forwards. In front they have a long trenchant denticulated molar followed by four others with four blunt tubercles. What particularly distinguishes these animals is their hind legs, which are much larger in proportion than the fore ones, that have no thumbs, and the two first toes united as far as the nail; so that, at a first glance, it seems as though there were but three toes, the middle one having two nails. They frequently walk upon two feet, at which times they employ their long and strong tail to support themselves. They have then the form and habits of the Kanguroos, from which they only differ in their superior canine tooth. They are frugivorous; their stomach is large, divided into two sacs, and has several inflations; but their cæcum is rounded and of a middling size.

Hyps. minor; Macropus minor, Shaw; White, Bot. Bay, 286; Voy. de Freycin. pl. 10. (The Kanguroo Rat.) Size of a small Rabbit; of a mouse-grey. From New Holland, where it is called *Potoroo*. It is the only species known.

The fourth subdivision only differs from the third in the absence of all canini whatsoever, it is the

Macropus, Shaw.—Halmaturus, Illig.(2)

The Kanguroos have all the characters we have assigned to the preceding genus, except that the superior canine is wanting, and that their middle incisors do not project beyond the others. The inequality of their legs is still greater, so that on all fours they can only walk slowly and with difficulty; they make vigorous leaps however with their hind feet, the great middle nail of which (almost in the shape of a hoof) also serves them for purposes of defence; for, by supporting themselves on one foot and their enormous tail, they can inflict a severe blow with that which is at liberty. They are very

(1) Υ ψοι πρυμνος; i. e. raised behind.

(2) *Halmaturus*, tail fit for leaping.

gentle herbivorous animals, their grinders presenting mere transverse ridges. They have five teeth in all, the front ones being more or less trenchant, and falling out with age; so that in old Kanguroos we frequently find but three. Their stomach consists of two long sacs that are inflated at several places like a colon. The cæcum also is large and has inflations. The radius allows a complete rotation of the fore-arm.

In these two genera the penis is not bifurcated, but the female organs of generation are similar to those of other Marsupialia.

M. major, Shaw; *Didelphis gigantea*, Gm.; Schreb. CLIII. (The Gigantic Kanguroo.) Sometimes six feet in height. It is the largest of the New Holland animals; was discovered by Cook in 1779, and is now bred in Europe. Its flesh is said to resemble venison. The young ones, which at birth are only an inch long, remain in the maternal pouch even when they are old enough to graze, which they effect by stretching out their necks from their domicile, while the mother herself is feeding. These animals live in troops, conducted by the old males. They make enormous leaps. It appears that we have hitherto confounded under this name several species of New Holland and its neighbouring countries, whose fur, more or less grey, only varies by a trifling difference of shade.(1) There is another species much more anciently known:

M. Brunii; Did. Brunii, Gm.; Schreb. CLIII.; called *Pelandor Aroé* by the Malays of Amboyna. (The Kanguroo of Aroé.) Larger than a Hare; brown above, fawn coloured beneath. Found in the islands near Banda, and in those of Solor. European naturalists had not paid sufficient attention to the descriptions of the above species given by Valentine and Le Bruyn.

M. elegans; Halma. elegans, Per. Voy. t. xxvii. (The Elegant Kanguroo.) Size of a large Hare; transversely striped with brown on a greyish-white ground. Found at the island of St Peter.

The fifth subdivision has two long incisors in the lower jaw

(1) M. Geoff. distinguishes the *Kanguroo enfumé*, in which the grey is deeper; the *Kanguroo à moustaches*, which has some white on the front of the upper lip; the *Kanguroo à cou roux*, a little less than the others, with some red on the nape of the neek. Messrs Lesson and Garnot also describe a brown Kanguroo which they call *Oualabate*, Voy. de Freycin. pl. ix. We shall also probably be obliged to make new species of the *Kanguroo roux-cannelle*, (*K. laniger*, Quoy and Gaym.) Voy. de Freycin. pl. ix; and of the *Kanguroo cendré-bleuatre*; but all these Quadrupeds require to be examined at various ages, and we must ascertain the influence of age and sex upon their colours, previous to a final establishment of the speeies.

but no canini; in the upper, two long incisors in front, a few small ones on the sides, and two small canines. It comprehends but one genus.

Koala, Cuv.—Lipurus, Gold.—Phascolarctos, Blain.

The Koalæ have a short, stout body; short legs, and no tail. The toes of their fore feet, five in number, when about to seize any object, separate into two groups; the thumb and index on one side, and the remaining three on the other. The thumb is wanting on the hind foot; the two first toes of which are united like those of the Phalangers and the Kanguroos. One species only is known:

K. cinerea; *Lipurus cinereus*, Gold.; Schreb. CLV, A, a. (The Koala.) Ash coloured; passes one part of its life in trees, and the other in burrows it excavates at their foot. The mother carries her young one for a long time on her back.

Finally, our sixth division of the Marsupialia, or the

Phascolomys, Geoff.(1)

Consists of animals which are true Rodentia in the teeth and intestines, their only relation to the Carnaria consisting in the articulation of their lower jaw; and in a rigorously exact system, it would be necessary to class them with the Rodentia. We should even have placed them there, had we not been led to them by a regular uninterrupted series from the Opossums to the Phalangers, from the latter to the Kanguroos, and from the Kanguroos to the Phascolomys; and finally, were it not that the organs of generation are every way exactly similar to those of the Marsupialia.

They are sluggish animals, with large, flat heads, and bodies that look as if they had been crushed. They are without a tail; have five nails on each of the fore feet, and four, with a small tubercle, in place of a thumb, on each of the hind ones, all very long and fit for digging. Their gait is excessively slow. They have two long incisors in each jaw, almost similar to those of the Rodentia; and each of their grinders has two transverse ridges.

They feed on grass; their stomach is pyriform, and their cæcum short and wide, furnished like that of Man, and of the Ourang-Outang, with a vermiform appendage. The penis is bifurcated, like that of the Opossums. One species only is known, the

Phas. ursinus; *Didelphis ursina*, Shaw; Peron. Voy. pl. xxxviii, (The Wombat.) Size of a Badger; fur abundant, of a more

(1) *Phascolomys*, a pouched rat, from φασκωλον and μυς.

or less yellowish brown. It is found in King's Island to the south of New Holland, where it lives in its burrow. Its flesh excellent.(1)

ORDER V.

RODENTIA.

We have just seen, in the Phalangers, canini so very small, that we cannot consider them as such. The nutriment of these animals, accordingly, is chiefly derived from the vegetable kingdom. Their intestines are long and their cæcum ample; and the Kanguroos, which have no canini whatever, subsist upon vegetables only. The Phascolomys might stand first in that series of animals of which we are about to speak, and which have a system of mastication still less complete.

Two large incisors in each jaw, separated from the molars by an empty space, cannot seize a living prey nor tear flesh; they cannot even cut the food, but they serve to file, and by continued labour, to reduce it into separate molecules, in a word, to *gnaw* it; hence the term *Rodentia* or *Gnawers*, which is applied to animals of this order. It is thus that they successfully attack the hardest substances, frequently feeding on wood and the bark of trees. The more easily to accomplish this object, the incisors have no thick enamel except in front, so that their posterior edges wearing away faster than the anterior, they are always naturally sloped. Their prismatic form causes them to grow from the root as fast as they wear away at the edge; and this tendency to increase in

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(1) M. Bass has described an animal, externally similar to the Phascolomys, and to which he also gives the name of *Wombat*, but which has six incisors, two canines and sixteen molars in each jaw. If there is no erroneous combination of the two different descriptions, it will form an additional subgenus to place near the Péramèles. Illiger has already established it under the name of *Amblotis*, from αμβλωτυς, abortus. See Petersb. Mem. 1803—1806, p. 444, and the Bulletin des Sc. No. 72, An. XI.

length is so powerful, that if one of them be lost or broken, its antagonist in the other jaw having nothing to oppose or comminute, becomes developed to a most monstrous extent. The lower jaw is articulated by a longitudinal condyle, in such a way as to allow of no horizontal motion, except from back to front, and *vice versa*, as is requisite for the action of gnawing. The molars also have flat crowns, whose enamelled eminences are always transverse, so as to be in opposition to the horizontal motion of the jaw, and to increase the power of trituration.

The genera in which these eminences are simple lines, and the crown is very flat, are more exclusively frugivorous; those in which the eminences of the teeth are divided into blunt tubercles are omnivorous; while the small number of such as have no points more readily attack other animals, and approximate somewhat to the Carnaria.

The form of the body in the Rodentia is generally such, that the hinder parts of it exceed those of the front; so that they rather leap than walk. In some of them this disproportion is even as excessive as it is in the Kanguroos.

The intestines of the Rodentia are very long; their stomach simple, or but little divided; and their cæcum very voluminous, even more so than the stomach. In the subgenus Myoxus, however, this intestine is wanting.

In the whole of this class the brain is almost smooth and without furrows; the orbits are not separated from the temporal fossæ, which have but little depth, and the eyes are altogether directed laterally. The zygomatic arches, thin and curved below, announce the weakness of the jaws; the forearms have nearly lost the power of rotation, and their two bones are often united; in a word, the inferiority of these animals is visible in most of the details of their organization. Those genera however which possess stronger clavicles have a certain degree of dexterity, and use their fore feet to convey their food to the mouth.

Some of them even climb with facility: such is the

Sciurus, Lin.

Squirrels are distinguished by their strongly compressed inferior incisors, and by their long tail furnished with hairs. They have four toes before, and five behind. The thumb of the fore foot is sometimes marked by a tubercle. They have in all four grinders, variously tuberculated, and a very small additional one above in front, that very soon falls. The head is large, and the eyes projecting and lively. They are light and active animals, living on trees, and feeding on fruits.

Sciurus, Cuv.

In the Squirrel, properly so called, the hairs of the tail are arranged on the sides, so as to resemble a feather. There are a great many species in the two continents.

Sc. vulgaris, Buff. VII, xxxii, Schreb. pl. 212. (The Common Squirrel.) The back of a lively red; belly white; ears terminated by a tuft of hair. Those of the north, in winter, become of a beautiful bluish ash colour, producing the fur called *minever* when taken only from the back, and *vair* (by the French) when it consists of the whole skin.

The American species have no pencils to their ears. Such are

Sc. cinereus, L.; *Petit-Gris*, of Buff. X, xxv. (The Grey Squirrel of Carolina.) Larger than that of Europe; ash coloured, with a white belly. *See Append. VIII of Am. Ed.*

Sc. capistratus, Bosc.;(1) *Sc. cinereus*, Schreb. CCXIII, B. (The Masked Squirrel.) Ash coloured; head black; muzzle, ears and belly white. Both these species vary in being more or less brown—they are sometimes entirely black.(2)

The greater number of the species belonging to the eastern continent are also destitute of these pencils. One of the most beautiful is the

Sc. maximus and *macrourus*,(3) Gm.; Buff. Supp. VII, lxxii. (The Large Squirrel of India.) Nearly the size of a Cat; above black; the flanks and top of the head of a beautiful bright maronne; the head, and all the under parts of the body, and the

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(1) See Append. VIII for some observations on our author's arrangement of the American Squirrels. *Am. Ed.*

(2) The *Sc. vulpinus*, the *carolinensis*, and the *niger* appear to be mere varieties of this species. [*See Append. VIII of Am. Ed.*]

(3) A comparison of the figure of Pennant with that of Sonnerat is sufficient to prove that they represent the same animal.

inside of the limbs pale yellow ; a maronne coloured band behind the cheek. It inhabits the palms, and is extravagantly fond of the milk of the cocoa-nut.

There are, also, several Squirrels in warm climates, that are remarkable for the longitudinal bands which vary their fur. Such are the

Sc. getulus, L.; Buff. X, xxvi. (The Barbaresque.) The bands of which extend to the tail, and even on it.

Sc. palmarum, L.; Buff. X, xxvi. (The Palmist.) On which the stripes are confined to the back.

It is probable that we shall have to separate from the Squirrels certain species which have cheek-pouches like the Hamsters, and pass their lives in subterraneous holes, the *Tamia* of Illiger. For instance the

Sc. striatus, L.; Buff. X, xxviii. (The Ground Squirrel.) Which is found throughout all the north of Asia and America, particularly in the pine forests. The tail is more scantily supplied with hairs than that of the European Squirrel; the ears smooth, and skin brown, with five black stripes and two white ones.

We ought also, most probably, to distinguish the *Guerlinguets*, a species with a long, and almost round tail, and an enormous pendant scrotum. They are found in both continents.(1)

The following have been separated already.

Pteromys, Cuv.(2)

Or the Flying Squirrels, to which the skin of the flank, extending between the fore and hind legs, imparts the faculty of supporting themselves for a moment in the air, and of making very great leaps. There are long bony appendages to their feet, which support a part of this lateral membrane.

There is a species in Poland, Russia, and Siberia.

Sc. volans, L.; Schreb. CCXXIII. (The Flying Squirrel.) Ash-coloured grey above ; white underneath ; size of a Rat ; the tail only half the length of the body. It lives solitarily in the forests.

One from North America.

Sc. voluccella, L.; Buff. X, xxi. (The American Flying Squirrel.) Reddish-grey above ; white beneath ; size less than

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(1) We have found however in the *Tamiæ* and *Guerlinguets* the same kind of teeth as in the Squirrels and Pteromys.

(2) *Pteromys*, Winged Rat.

that of the preceding; tail three-fourths as long as the body. It lives in troops in the prairies of North America.

There is one found in the Indian Archipelago, that is nearly the size of a Cat; the male of a fine lively maronne above, and red underneath; the female brown above and whitish underneath. It is the

Sc. petaurista, L.; Buff. Supp. III, xxi, and VII, lxvii. (The Taguan.) The same place produces another small one, the

Sc. sagitta, L. A deep brown above; white beneath; distinguished from other species, the small ones especially, by its membrane, which, as in the Taguan, forms an extremely acute projecting angle behind the tarsus.(1)

M. Geoffroy has very properly separated from this genus the

Cheiromys, Cuv. (2)

Or the Aye-Ayes, whose inferior incisors, much more compressed, and above all, more extended from front to back, resemble ploughshares. Each foot has five toes, of which four of the anterior are excessively elongated, the medius being more slender than the others; in the hind feet the thumb is opposable to the other toes; so that they are in this respect among the Rodentia, what the Opossums are among the Carnaria. The structure of their head is otherwise very different from that of the other Rodentia, and is related to the Quadrumana in more points than one.

There is only one species of the Aye-Aye known. It was discovered at Madagascar by Sonnerat. It is the *Cheir. Madagascariensis; Sc. Madagascar.*, Gm.; Buff. Supp. VII, lxviii. (The Aye-Aye.) Size of a Hare, of a brown colour, mixed with yellow; tail long and thick, with stout black bristles; ears large and naked. It is a nocturnal animal, to which motion seems painful; it burrows under ground, and uses its slender toe to convey food to its mouth.

Linnæus and Pallas united in one single group, under the name of

Mus, Lin.,

All the Rodentia furnished with clavicles, which they could not distinguish by some very sensible external character, such as the tail of the Squirrel or that of the Beaver, from which resulted the utter impossibility of assigning to them any common character; the greater number had merely pointed lower incisors, but even this was subject to exceptions.

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(1) Add *Pt. hudsonius*, Gm. *Am. Ed.*

(2) *Cheiromys*, a rat with hands.

Gmelin has already separated from them the Marmots, Dormice, and the Jerboas; but we carry their subdivision much further, from considerations founded on the form of their grinders.

Arctomys,(1) Gm.

The Marmots, it is true, have the inferior incisors pointed like those of the greater number of animals comprehended in the great genus Mus; but their grinders, like those of the Squirrel, amount to five on each side above, and four below, all bristled with points; accordingly, some species are inclined to eat flesh and feed upon insects, as well as grass. There are four toes and a tubercle in place of a thumb to the fore feet, and five toes to the hind ones. In other respects these animals are nearly the direct reverse of the Squirrels, being heavy, having short legs, a middle sized or short hairy tail, and a large flat head, passing the winter in a state of torpor, and shut up in deep holes, the entrance of which they close with a heap of grass. They live in societies, and are easily tamed. Two species are known in the eastern continent.

Arct. alpinus; *Mus alpinus*, L.; Buff. VIII, xxviii. (The Alpine Marmot.) Large as a Hare; tail short; fur yellowish grey, with ash coloured tints about the head. It lives in high mountains, immediately below the region of perpetual snow.

Arct. bobac; M. bobac, L.; Pall. Glir. V; Schreb. CCIX. (The Bobac.) Size of the preceding; of a yellowish grey, tinted with red about the head. Inhabits low mountains and hills, from Poland to Kamschatka, and frequently digs its burrow in the hardest soil.(2)

America also produces some species.

Arct. monax; Buff. Supp. III, xxviii. (The Maryland Marmot.) Grey; tail blackish, as well as the top of the head.

Arct. empetra, Pall.; Schreb. CX. Less than the preceding; grey; red beneath.

Spermophilus, Fred. Cuv.

We apply this name to those Marmots that have cheek pouches. The superior lightness of their structure has caused them to be called Ground Squirrels. Eastern Europe produces one species:

M. citillus, L.; Buff. Supp. III, xxxi. (The Souslik or Zizel.) A pretty little animal, of a greyish brown, watered or mottled

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(1) *Arctomys*, Bear-Rat.

(2) Russian Travellers in Bucharia mention some other Marmots, *Arct. fulvus*, *Arct. lepto-dactylus*, *Arct. musogaricus*, which are not yet perhaps sufficiently distinguished from the Bobac or from the Souslik.

with white, the spots very small, which is found from Bohemia to Siberia. It has a peculiar fondness for flesh, and does not spare even its own species.

North America has several species of them, one of which is remarkable by the thirteen fawn coloured stripes which extend along the back on a blackish ground. It is the *Thirteen striped Souslik*, *Arct.* 13-*lineatus*, Harl.; or *Sciurus* 13-*lineatus*, Mitchell; or *Arct. Hoodii*, Sabine, Lin. Trans. XIII, pl. xxix.(1)

There is one of the Rodentia which it appears we must approximate to the Marmots, that is remarkable for living in large troops in immense burrows, which have even been styled villages. It is called the *Prairie Dog* or *Barking Squirrel*, the latter appellation arising from its voice, which resembles the bark of a small Dog. It is the *Arct. ludovicianus*, of Say, Jour. to the Rocky Mountains, I, 451. M. Rafinesque, who states it has five toes to each foot, makes it the type of his genus Cynomys.

Myoxus, Gm.(2)

The Dormice have pointed lower incisors, and four grinders, the crown of each of which is divided by enamelled lines.

They are pretty little animals, with soft fur, a hairy and even tufted tail, and a lively eye, which live on trees like Squirrels, and feed on fruit. Of the numerous order of the Rodentia, this is the only subgenus in which there is no cæcum. They become torpid in winter like the Marmots, and pass through it in the most profound lethargy.(3)

M. glis, L.; Buff. VIII, xxiv. (The Fat Dormouse.) Size of a Rat; ashy grey-brown above, whitish underneath; of a deeper brown around the eyes; tail very hairy the whole of its length, and disposed somewhat like that of a Squirrel, and frequently a little forked at the extremity. It inhabits the south of Europe, and nestles in the hollows of trees and fissures of rocks. It sometimes attacks small birds. This is probably the Rat, fattened by the ancients, among whom it was considered a delicacy of the very highest description.(4)

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(1) Add *Arct. Parrii*, Richards., App. Parry's Voy.—Several of the Marmots announced in the travels of Lewis and Clarke, Parry, Franklin, &c. *Arct. Franklinii*, *Richardsonii*, *pruinosa*, seem to belong to this subgenus. See Sabine, Lin. Trans. XIII, pl. xxvii, xxviii, &c.

(2) *Myoxus*, Rat with a pointed nose.

(3) So natural is this to them, that a dormouse from Senegal, (*M. Coupeii*) which had never experienced it in its native country, fell into a profound sleep in Europe the moment it was exposed to the cold.

(4) The *M. dryas* of some authors (Schreb. 220, B) does not appear to me to differ from the Fat Dormouse.

M. nitela, Gm.; Buff. VIII, xxv. (The Garden Dormouse.) Somewhat less than the preceding; greyish brown above; white underneath; black round the eye, which extends to the shoulder; tail tufted and black, tuft white. Common in the gardens of Europe, where it shelters itself in holes about the walls, and does much injury to trees.

M. avellanarius, L.; Buff. VIII, xxvi. (The Common Dormouse.) Size of a Mouse; cinnamon red above; white beneath; hairs of the tail somewhat disposed like a feather. From the forests of all Europe. It constructs its nest of grass on low branches, to bring up its young; the rest of the time, and particularly during winter, it remains in the hollows of trees.(1)

We should place near the Dormice, the

ECHIMYS, Geoff.—LONCHERES, Illig.(2)

Four grinders also, but formed in a peculiar way; the upper ones consisting of two blades, bent into the shape of a V, and the under ones of one blade only that is bent, and of another that is simple. The fur of several species is harsh, and intermixed with flattened spines or prickles, like sword blades. From America. One of them,

Ech. chrysuros, Schreb. CLXX, B; *Lerot à queue dorée*, Buff. Supp. VII, 72. (The Golden-tailed Echimys.) More than twice the size of the Brown Rat; it is a beautiful animal, of a chesnut brown colour; white belly; an elongated crest of hairs, and a white longitudinal band on the head; the tail is long and black; the posterior half yellow. From Guiana.

Ech. rufus; Rat épineux, Azzara, Voy. pl. xiii. (The Red Echimys.) Size of a Rat, and of a reddish grey; tail shorter than the body. It is found in Guiana, Brazil, and Paraguay. It excavates long subterraneous galleries.

Others, again, have merely the ordinary kind of hair, more or less rough. The most remarkable is the

Ech. dactylicus, Geoff. (The Long-toed Echimys.) Which is still larger than the chrysuros, and has the two middle toes of the fore feet double the length of the lateral ones. Its scaly tail is longer than the body; its fur is a yellowish grey, and the hairs on its nose form a crest directed in front.(3)

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(1) Add *Myoxus Coupëii*, Fred. Cuv. Mammif.

(2 *Echimys*, or Spiny Rat. *Am. Ed.*

(3) Add the Echimys of Cayenne, the Silky Echimys. I suspect the *Mus. paradoxus*, Thomas, Lin. Trans. XI, (HETEROMYS, Lesson) differs from the Echimys in its cheek-pouches only. However, not having seen its teeth, I cannot arrange it.

Hydromys, Geoff.

The Hydromys have many external points of relation to the Echimys, but they are distinguished from all other Rats by their hind feet, two-thirds of which are palmated; their two molars have also a peculiar character in the crown, which is divided into obliquely quadrangular lobes, whose summits are hollowed out like the bowl of a spoon. They are aquatic.

Several of these animals have been sent to Europe from Van Dieman's land, some of which have the belly white, and others fawn coloured, but all of a deep brown above, with a long tail which is black at the base, and the posterior half white. They are sometimes double the size of the brown Rat. *Hydromys leucogaster*, and *Hyd. chrysogaster*, Geoff. An. Mus. VI, pl. xxxvi.

Capromys, Desmar.

The Houtias have four molars every where with flat crowns, the enamel of which is folded inwards so that it forms three angles on the external edge, and one only on the internal edge of the upper teeth, and the inverse in the lower ones. The tail is round and scantily pilose; they have, like the Rats, five toes to the hind foot, and four, with the rudiment of a thumb, to the fore feet; their form is that of a Rat; as large as a Rabbit or Hare. Two species are known.

Cap. fournieri, Desmar., Mem. de la Soc. d'Hist. Nat. de Par. I, 1823. (The Congo Houtia.)(1) Brown; muzzle and top of the neck whitish; tail brown, but half the length of the body.

Cap. prehensilis, Pœssig. Less than the preceding; brown, with a whitish throat; tail red, as long as the body, and partly naked at the end. Both species inhabit the island of Cuba, and together with the *Agoutis*, at the time of the discovery, constituted the principal game of the Indians.

Mus, Cuv.

The true Rats have three molars every where, of which the anterior is the largest; its crown is divided into blunt tubercles, which by being worn, give it the shape of a disk, sloped in various directions; the tail is long and scaly. These animals are very injurious from their fecundity, and the voracity with which they devour every

(1) This is the *Isodon pilorides*, Say, Zool. Journ. No. 2, p. 229.

thing that comes within their reach. There are three species which have become quite common in our houses, viz.

M. musculus, L.; Buff. VII, xxxix. (The Common Mouse.) Universally known.

M. rattus, L.; Buff. VII, xxxvi. (The Black Rat.) Of which no mention is made by the ancients, and which appears to have entered Europe in the middle century. It is more than double the size of the Mouse in each of its dimensions. The fur is blackish. Several individuals have been occasionally found connected by the interlacing of their tails; constituting what the Germans style the *King of Rats*.(1)

M. decumanus, Pall.; Buff. VIII, xxvii. (The Norway or Brown Rat.) Which did not pass into Europe till the eighteenth century, and is now more common in large cities than the Black Rat itself. It is larger than the latter by one-fourth, and differs from it also by its reddish-brown hair.(2)

These two large species appear to have originated in the East, and have been transported in ships, together with the Mouse, to all parts of the globe.

Eastern Tartary and China have a Rat equal to the decumanus.

M. caraco, Pallas, Glir. XXIII; Schreb. clxxvii. (The Caraco Rat.) Of a light colour; tail a little shorter than the preceding, and the jaws stronger.

There is another in India, one-fourth larger than the Brown Rat, the *Rat perchal*, Buff. Supp. VII. lxix, which is of a reddish brown. There is a large one in the Indian Archipelago, the

M. setifer, Horsf. Jav. Of a blackish brown. These last two species are bristled over with setaceous hairs, which extend beyond the others.

One of the largest and most mischievous Rats known is the

M. pilorides, Pall. and Gm. (The Musk-Rat of the Antilles.) Fifteen inches in length without the tail, which is still longer than the body; hair coarse, of a deep black above, and whitish beneath.(3)

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(1) See Bellerman on the King of the Rats (in German), Berlin, 1820.

(2) It appears to belong to Persia, where it lives in burrows. It was not till 1727, that, after an earthquake, it arrived at Astracan, by swimming across the Volga.

(3) Pallas and Gmelin erroneously describe it as being entirely white. The earlier historians of the colonies attribute to it the above colours, which are precisely such as we have seen on the animal.

Fewer species have been observed of the size of the Mouse.

M. cahirinus, Geoff., Descr. de l'Eg. Mammif. (The Cairo Mouse.) Spines on the back in place of hairs—noticed by Aristotle.

One species only is known in France that does not reside in houses, the *M. sylvaticus*. (Field Mouse.) Buff. VII, xli, which is hardly larger than the Mouse, and is distinguished from it by its red fur. It does much injury to trees, and sometimes penetrates into gardens.

It seems, however, that in some of the provinces there is a smaller and grey species, which has also been observed in England, (*M. messorius*, Shaw, Vol. II, Part 1, Frontisp.) and a third still more diminutive (*M. pumilus*, Fr. Cuv. Mammif.).(1)

Warm climates produce Rats, similar in every particular to those of which we have just spoken, except that their tails are more hairy.(2)

Gerbillus, Desm.—Meriones, Illig.

The Gerbils have molars that differ very little from those of Rats, merely becoming sooner worn, so as to form transverse elevations. Their superior incisors are furrowed with a groove; their hind feet

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(1) To this division, most probably, belong the *M. agrarius*, *M. minutus*, *M. soricinus*, *M. vagus*, *M. betulinus*, *M. striatus*, *M. barbarus*, Schreb.

Here also should come the enormous *Mus giganteus*, Hardw. Linn. Trans. VII, xxviii.

There should be likewise added the *M. pumilio*, Sparm. the *M. cyanus*, Molina, and several other species, some of which are not even mentioned by authors, and others which are described with too little comparison. This is the reason why most of the Rats of Azzara cannot be properly classed until they are re-examined. The same observation applies to a great many of the Rodentia of M. Rafinesque. Their descriptions are too short to be of any use.

(2) *Hypudæus variegatus*, Lichtenst. var. flava.—*Meriones syenensis*, Id. to which must be added the *Arvicola messor*, Le Conte, *Arv. hortensis*, Harl. or *Sygmodon*, Say, distinguished however by hairy ears, like the Otomys.

Another group, with hairy tails also, but whose teeth wear away faster, will include the *Hypudæus obesus*, Lichtenst. the *Mus ruficaudatus*, Id. His *Meriones sericeus* should form a third, characterized by the projecting ridges of the molars, which alternately catch in each other.

We then have to group the *Neotoma floridanum* of Say, or the *Arvicola floridanus* of Harlan, and the *Arvicola gossypina*, Le Conte, two Rats which, size excepted, are very similar even in their colours, whose teeth, provided with roots, if worn a little, have crowns formed like those of the Arvicola.

These animals, however, previous to a definite classification, require to be completely examined and compared, internally as well as without. [*See Append. IX of Am. Ed.*]

are somewhat longer in proportion than those of Rats in general, and their thumb and little toe slightly separated. Their tail is long and hairy. The sandy and warm parts of the eastern continent produce several species.

G. indicus; Dipus indicus, Hardw., Linn. Trans. VIII, pl. vii; *Hérine*, Fred. Cuv. Mammif. (The India Gerbil.) Size of the fat Dormouse; fawn coloured above, whitish beneath; tail longer than the body, and blackish at the end. To this species should be approximated the

G. meridianus; D. meridianus, Schreb. 231. (The Torrid Gerbil.) Which is about the same colour, but a little smaller.

G. tamaricinus; *D. tamaricinus*, Schreb. 232. (The Tamarisk Gerbil.) The tail is annulated with brown.

G. pyramidum; D. pyramidum, Oliv. (The Gerbil of the Pyramids.) The hind feet more elongated; size of the fat Dormouse; red above, whitish beneath.

There is one in Senegal of a livelier red and a purer white.

Another at the Cape a little larger, reddish, and the tail less hairy at the end.

A third in Nubia, about half the size, of a light red above, and a beautiful white beneath. The

Meriones, Fred. Cuv.

Which we separate from the other Gerbils, have the hind feet still longer; the tail nearly naked, and a very small tooth before the superior molars; characters which approximate them to the Jerboas. Their upper incisors are grooved like those of the Gerbils, and their toes also are similar. There is a small species in North America, the

Mus canadensis, Penn.; *Dipus canadensis*, Sh. II, part 1, pl. 161; *Dipus americanus*, Barton. Size of a Mouse; fawn coloured grey; tail longer than the body. A very active animal, that shuts itself up in its burrow, and passes the winter in a state of lethargy.(1)

Cricetus, Cuv.

The Hamsters have nearly the same kind of teeth as Rats, but their tail is short and hairy, and the two sides of their mouth are hollowed into sacs or cheek pouches, in which they transport the grain they collect to their subterraneous abodes.

C. vulgaris; M. cricetus, L.; Marmotte d'Allemagne, &c.;

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(1) Add *Gerbillus labradorius*, Harl., or *M. labrad.*, Sabine, Frankl. Voy. p. 661.

Buff. XIII, xiv. (The Common Hamster.) Larger than the Rat; of a reddish-grey above, black on the flanks and underneath, with three whitish spots on each side. The feet, a spot under the throat, and another under the breast white; some individuals are all black. This animal, so agreeably varied in colour, is one of the most noxious that exist, gathering large quantities of grain with which it fills its burrow that is sometimes seven feet deep. It is common in all the sandy regions, that extend from the north of Germany to Siberia.

This last country produces several small species of Hamsters described by Pallas.(1)

Arvicola, Lacep.

The Arvicolæ, like the Rats, have three grinders every where, but without roots, each one being formed of triangular prisms, placed on two alternate lines. They may be subdivided into several groups, viz.

Fiber, Cuv.

The Ondatras or Field Rats having semi-palmated hind feet, a long, scaly and compressed tail, of which one species only is well known.

F. vulgaris; Castor zibeticus, L.; Mus zibeticus, Gm.; Buff. X, i. (The Canadian Musk-Rat or Ondatra.) As large as a Rabbit, of a reddish-grey. In winter they construct, on the ice, a hut of earth, in which several of them reside together, passing through a hole in the bottom, for the roots of the *acorus* on which they feed. They neither dive nor swim well. It is this habit of building which has induced some authors to refer the Ondatra to the genus Castor. The second subdivision is that of

Arvicola, Cuv.—Hypudæus, Illig.

Our common Field Rats, which have a hairy tail, about the length of the body, and simple or not palmated feet.

A. vulgaris; *Mus amphibius*, L.; Buff. VII, xliii. (The Water Rat.) A little larger than the Common Rat, of a deep greyish-brown; tail the length of the body. Inhabits the banks of rivers, &c. and burrows in marshy places.

A. terrestris; Mus terrestris, Lin. (The Schermaus.) Seems to differ from the Water Rat only in being somewhat smaller; its tail also is shorter. It lives under ground like the Mole,

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(1) *M. accedula.—M. arenarius.—M. phœus.—M. songarus.—M. furunculus.* See Pall. Glir. and Sch.

preferring the bottom lands of high grounds. It excavates galleries, and removes the earth to some distance from the opening. Its magazines, which are principally filled with the roots of the wild carrot cut into two inch pieces, are frequently two feet in diameter.

A. arvalis ; Mus arvalis, L.; Buff. VII, xlvii. (The Campagnol.) Size of a Mouse ; of a reddish-ash colour ; tail not so long as the body. It inhabits holes which it excavates in the earth, where it collects grain for the winter. The multiplication of this animal is sometimes so excessive as to cause much injury.

A. œconomicus, Mus œconomicus, Pall. Glir. XIV, A ; Schreb. cxc. (The Meadow Campagnol.) A little darker coloured, and the tail somewhat shorter. It lives in a sort of oven-shaped chamber formed under the turf, from which issue several narrow and ramifying canals running in various directions; other canals communicate with a second cavity which contains its provisions. From all Siberia. It is thought to have been found in Switzerland and in the south of France, particularly, as we are assured, in the potatoe fields.(1) *See Append. X of Am. Ed.*

Georychus, Illig.

Or the Lemmings, Cuv. have very short ears and tail, and the toes of the fore feet peculiarly well formed for digging.

The two first species have five very distinct nails to each of the fore feet, like the Rat-Moles and the Jumping-Hare.

G. lemmus ; Mus lemmus, L.; Pall. Glir. XII, A. B. Schreb. cxcv. (The Lemming.) A northern species, as large as a Rat, with black and yellow fur, very celebrated for its occasional migrations in innumerable bodies. At these periods they are said to march in a straight line, regardless of rivers or mountains ; and while no obstacle can impede their progress, they devastate the country through which they pass. Their usual residence appears to be the shores of the Arctic ocean.

G. vulgaris ; Mus aspalax, Gm., Pall. Glir. X, Schreb. CCV. (The Zocor.) Reddish-grey; the three middle nails of the fore feet long, arcuate, compressed and trenchant, for cutting earth

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(1) Here most probably would come the *M. saxatilis, alliarus, rutilus, gregalis* and *socialis*, Pall. Glir. But the *M. lagurus* and *torquatus* come nearer to the Lemmings. There are several Field-Rats or Campagnols in North America, such as the *Arvicola xanthognatha*, Leach, Miscel. I, pl. xxvi.—*Arvicola pennsylvanica*, Wilson, Amer. Ornith. VI, pl. l, F. 3.—*Arv. palustris*, Harl. &c. Better figures and new and comparative descriptions of the preceding species are much wanted.

and roots. The limbs are short; there is scarcely any tail; and the eyes are excessively small. From Siberia; where it always lives under ground like the Mole and Rat-Mole. It feeds principally on the bulbs of different Liliaceæ. The third species, like the other animals comprised in the great genus of Rats, has merely the rudiment of a thumb on the fore foot.

G. hudsonius; Mus hudsonius, Gm., Schreb. CXCVI. (The Lemming of Hudson's Bay.) A light pearly-ash colour; without tail or external ears; the two middle toes of the fore foot of the male seem to have double claws, which is owing to the skin at the end of the toe being callous and projecting from under the nail, a disposition of the part hitherto unknown, except in this animal. It is the size of a Rat, and lives under ground in North America.

Otomys, Fred. Cuv.

The Otomys are nearly allied to the Field Rats, and have also three grinders, but they are composed of slightly arcuated laminæ arranged in file.(1) Their incisors are grooved with a longitudinal furrow, and the tail is hairy, as well as the ears, which are large.

O. capensis, Fred. Cuv. (The Cape Otomys.) Size of a Rat; fur marked with black and fawn coloured rings; tail a third shorter than the body.(2)

Dipus, Gm.

The Jerboas(3) have nearly the same kind of teeth as the true Rats, except that there is sometimes a very small one immediately before the upper molars. The tail is long and tufted at the end; the head large; the eyes large and prominent; but their principal character consists in their posterior extremities, which, in comparison with the anterior, are of a most immoderate length, and above all, in the metatarsus of the three middle toes, which is formed of one single bone, resembling what is called the tarsus in Birds. It is from this disproportion of the limbs that they were named by the ancients Biped Rats, and in fact they seldom move otherwise than by great leaps on their hind feet. There are five toes to each of the

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(1) They are exact models, in miniature, of the grinders of the Elephant.

(2) It is the same animal described and represented in the essay on the genus of Rats, by M. Brantz, Berlin, 1827, under the name of *Euryotis irrorata*.

(3) There has lately appeared an excellent paper on the Jerboas, by M. Lichtenstein, in which that learned naturalist deseribes and figures ten species. I can only refer my readers to the paper itself. It is inserted in the Journal of the Acad. of Berlin.

fore feet, and in certain species, besides the three great toes to the hind feet, there are small lateral ones. They live in burrows, and become torpid during the winter.

D. sagitta; M. sagitta, L.; Buff. Supp. VI, xxxix and xl. The Jerboa has only three toes, and is the size of a Rat; a light fawn colour above; white beneath; tuft of the tail black, the tip white. Is found from Barbary to the north of the Caspian sea.

D. hirtipes, Licht. (The Hairy-footed Jerboa.) The head more compressed; only three toes to the hind feet, as in the Jerboa, but they are more hairy. From Africa.(1)

D. jaculus; *M. jaculus*, Pall. Glir. XX, Schreb. CCXXVIII. (The Alactaga.) Two small lateral toes; ears longer than those of the Jerboa, but is nearly of the same colour. Pallas has observed them of three sizes, from that of a Rabbit to that of a Rat: they are probably as many species.(2) One or the other is found from Barbary to the Eastern Ocean, and as far as the north of India.

Helamys, F. Cuv.—Pedetes, Illig.(3)

The Jumping Hares, like the Jerboas, have a large head, and great eyes, a long tail, and the anterior part of the body extremely small, in comparison to the posterior, although the disproportion is much less than in the true Gerboas. The peculiar characters of the Helamys are four grinders every where, each one composed of two laminæ; five toes to the fore-feet, armed with long and pointed nails, and four to their great hind ones, all separate, even to the bones of the metatarsus, and terminated by large nails, almost resembling hoofs. This number of toes is the inverse of that most common among the Rats. Their inferior incisors are truncated, and not pointed like those of the true Jerboas, and of the greater part of the animals comprised under the genus of Rats. One species only is known, the

H. caffer.; Mus. caffer., Pall.; *Dipus caffer.*, Gm., Buff. Supp. VI, xli, and better, Fred. Cuv. Mammif. It is the size of a Hare, of a light fawn colour, and has a long tufted tail, with a black tip. Inhabits deep burrows at the Cape of Good Hope.(4)

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(1) Add the *Dip. telum*, *D. platurus*, and *D. lagopus* of Eversman, Voy. de Mayendorf en Boucarie, p. 390.

(2) Pallas has latterly distinguished the small Alactagas by the name of *Dip. acontion.*

(3) *Pedetes*, jumper, *Helamys*, Jumping-Rat.

(4) *See Append. XI of Am. Ed.*

Spalax, Gulden.

The Rat-Moles have also been very properly separated from the Rats, although their grinders are three in number, and tuberculous, as in the true Rats, and the Hamsters, and are merely a little less unequal. Their incisors, however, are too large to be covered by the lips, and the extremities of the lower ones are trenchant, rectilinear, and transverse, not pointed. Their legs are very short; each foot has five short toes, and as many flat and slender nails. Their tail is very short, or rather there is none; the same observation applies to their external ear. They live under ground like the Moles, raising up the earth like them, although provided with much inferior means for dividing it, but they subsist on roots only.

S. typhus; M. typhus, Pall. Glir. pl. viii, Schreb. 206. (The Zanni, Slepez or Blind Rat-Mole.) A singular animal, which, from its large head, angular on the sides, its short legs, the total absence of a tail and of any apparent eye, has a most shapeless appearance. The eye is not visible externally, and we merely find beneath the skin a little black point, which appears to be organised like one, but which cannot serve for the purpose of vision, since the skin passes over it without opening or even growing thinner, and being as much covered with hair as any other part. It is rather larger than our Rat; its fur is smooth, and of an ash colour, bordering on a red. This is the animal, in the opinion of Olivier, to which the ancients alluded when they spoke of the Mole as being perfectly blind.

The islands in the straits of Sunda produce a Rat-Mole as large as a Rabbit, of a deep grey colour, with a white longitudinal stripe on the head, the *Spalax javanus*.

From the Rat-Moles themselves should have been separated the

Bathyergus, Illig.—Orycteres, Fr. Cuv.

Which, with the general form, feet, and truncated incisors of that genus, have four grinders throughout. Their eye, though small, is visible, and they have a short tail.

B. maritimus; Mus maritimus, Gm.; *Taupe des dames*, Buff. Supp. VI, xxxviii. (The Maritime Rat-Mole.) Nearly the size of a Rabbit; the superior incisors furrowed with a groove, and the hair of a whitish grey.

B. capensis; M. capensis, Gm.; *Taupe du Cap.*, Buff. Supp. VI, xxxvi. (The Rat-Mole of the Cape.) Hardly as large as the Guinea-Pig; brown, with a spot round the ear, another round the eye, and a third on the vortex, together with the end of the muzzle, white. The incisors are smooth.

B. hottentottus, Less. and Garn., Voy. de la Coquille, pl. ii. (The Hottentot Rat-Mole.) Smaller; grey; incisors smooth; hardly as large as a Rat. The

Geomys, Rafin.—Pseudostoma, Say.—Ascomys, Lichten.

Which have four compressed prismatic molars throughout; the first double, the remaining three simple; the upper incisors furrowed with a double groove in front; five toes to each foot; the three middle anterior nails, that of the medius particularly, very long, crooked, and trenchant. They are low animals, and have very deep cheek-pouches, which open externally, enlarging the sides of the head and neck in a singular manner. One species only is known,

G. bursarius; Mus bursarius, Shaw.(1) (The Canada Hamster.) Size of a Rat; fur of a reddish grey; tail naked, and but half the length of the body. Inhabits deep burrows in the interior of North America.

Diplostoma, Rafin.

The Diplostomæ are almost precisely similar to the Geomys, but they have no tail.(2)

These animals are also from North America. The species before us is reddish, and ten inches in length.

We now pass to larger Rodentia than those of which we have hitherto spoken, but of which several still have well defined clavicles. Of this number is the

Castor, Lin.

The Beavers are distinguished from all other Rodentia by their horizontally flattened tail, which is nearly of an oval form, and covered with scales. They have five toes to each foot: those of the hinder ones are connected by membranes, and that next to the thumb has a double and oblique nail. Their grinders, to the number of four throughout, and with flat crowns, appear as if formed of a doubled bony fillet, or so as to show one sloping edge at the internal

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(1) The figures of this animal, first published Trans. Lin. Soc. Vol. V, pl. viii, and Shaw, Vol. II, part I, pl. 138, represent it with the internal skin of the cheek-pouches turned inside out, as though it had two sacs to the sides of the head. There is nothing like it in nature. It is well represented, Acad. Berlin, 1822 and 1823, pl. ii.

(2) M. Rafinesque describes them as having only four toes to each foot. The European species has five, like the Geomys.

extremities of the upper row, and three at the external; in the lower ones it is exactly the reverse.

Beavers are large animals, whose life is completely aquatic; their feet and tail aid them equally in swimming. As their chief food is bark, and other hard substances, their incisors are very powerful, and grow as rapidly from the root, as they are worn away at the point. With these teeth they cut trees of every description.

Large glandular pouches which terminate on the prepuce produce a highly odorous oily substance, employed in medicine under the name of *Castor*. The organs of generation in both sexes terminate in the extremity of the rectum, so that there is but a single external opening.

C. fiber, Buff. VIII, xxxvi. (The Beaver.) Larger than the Badger, and of all quadrupeds the most industrious in constructing a dwelling, to effect which these animals act in concert. They are found in the most solitary parts of North America.

Beavers choose water of such a depth as is not likely to be frozen to the bottom, and, as far as possible, running streams, in order that the wood which they cut above, may be carried downwards by the current to the spot where it is to be used. They keep the water at an equal height, by dams composed of branches of trees, mixed with clay and stones, the strength of which is annually increased, and which finally, by the progress of vegetation, becomes converted into a hedge. Each hut serves for two or three families, and consists of two stories; the upper is dry for the residence of the animals, and the lower under water for their stores of bark, &c. The latter alone is open, and the entrance is under water, having no communication with the land. The huts are a kind of rude wicker-work, being made of interwoven branches and twigs of trees plastered with mud. There are always several burrows along the bank, in which they seek for shelter when their huts are attacked. They only reside in these habitations during the winter; in the summer they separate, and live solitarily. The Beaver may be easily tamed, and accustomed to feed on animal matters. It is of a uniform reddish brown colour, and the fur, as is well known, is in great demand for hatters. It is sometimes found flaxen coloured, at others black, or even white.

Notwithstanding we have carefully compared the Beavers which burrow along the banks of the Rhone, the Danube, and the Weser, with those of North America, we are unable to determine whether the former are distinct species, or are prevented from building by the vicinity of man.

Myopotamus, Commer.

The Couias resemble the Beaver in size, in their four nearly similarly composed molars, in their powerful yellow-tinted incisors, and in their five-toed feet, the hinder ones of which are palmated; but their tail is round and elongated. They are aquatic animals also. One only is known, the

M. coipus; Mus coipus, Molin., Geoff. Ann. Mus. VI, pl. xxxv. (The Couia.) Which lives in burrows along the banks of rivers throughout a great part of South America. The fur, which is of a yellowish grey, mixed with down at the root, is employed by the hatters like that of the Beaver, and is consequently an important article of commerce. Thousands of their skins are sent to Europe.

Hystrix, Lin.

The Porcupines are known at the first glance by the stiff and sharp spines, or quills (as they are called) with which they are armed, like the Hedgehogs among the Carnaria. Their grinders are four throughout, with flat crowns, variously modified by plates of enamel, between which are depressed intervals. Their tongue is bristled with spiny scales, and their clavicles are too small to rest upon the sternum and scapula, being merely suspended by ligaments. They live in burrows, and have many of the habits of Rabbits. To their grunting voice, and thick truncated muzzle, are they indebted for being compared to the Pig, and for their corresponding French appellation of *porc-epic*.

Porcupines, properly so called,

Have the head more or less convex or vaulted, by the development of the bones of the nose. They have four toes before, and five behind, all armed with stout nails.

H. cristata, L.; Buff. XII, pl. li and lii. (The Common Porcupine.) Inhabits the south of Italy, Spain, and Sicily; it is also found in Barbary. The spines are very long, and annulated with black and white; a mane composed of long hairs occupies the head and neck. The tail is short, and furnished with hollow truncated tubes, suspended to slender pedicles, which make a noise when shaken by the animal. The chanfrin of the bony head is extremely convex. There are other species not very different, but with a less convex head, in India and in Africa.

We separate from the true Porcupines the

Atherurus, Cuv.

Where neither the head nor muzzle is inflated, and in which we observe a long non-prehensile tail; the toes are like those of the true Porcupines.

Hyst. fasciculata, L.; Buff. VII, 77; Schreb. 170.(1) (The Pencil-tailed Porcupine.) The upper part of the spines on the back grooved, and the tail terminated by a bundle of flattened horny slips, constricted from space to space.

Eretison, F. Cuv.

The Ursons have a flat cranium; the muzzle short, and not convex; the tail of a middle size, and the spines short, and half hidden in the hair. One species only is known, the

Hystrix dorsata, L.; Buff. XII, lv. (The Urson.) From North America.(2)

Synetheres, F. Cuv.

The muzzle short and thick; the head vaulted in front, and the spines short; the tail long, naked at the extremity, and prehensile, like that of an Opossum or Sapajou. There are only four toes, all armed with claws; they climb trees.

Hyst. prehensilis, L.; *Cuendu*, Marcg., *Hoitztlaquatzin*, Hernand.(3) (The Prehensile-tailed Porcupine.) Hair of a brownish-black; spines black and white.

Hystrix insidiosa, Lichtenst.; the *Couiy* of Azzara; Pr. Max. Brazil. Smaller; the spines partly red or yellow, and hidden during a part of the year under its long greyish-brown hair.

Lepus, Lin.

Hares have a very distinctive character in their superior incisors, which are double, that is, each of them has a smaller one behind

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(1) This figure, copied from Seba, I, 52, i, is too short. That of Buff. is better, but the slips at the end of the tail are not represented with sufficient distinctness. We can conjecture no reason by which De Blainville and Desmarets refer this species to the genus of Rats; it has the teeth, and other characters of the Porcupines, external as well as internal.

(2) The pretended *Coendoù* of Buffon is also an Urson, but a disfigured specimen that had lost its hair. See Buff. XII, 54.

(3) This word, in the Mexican language, means *Spiny Opossum*. It is the long tailed Coendou of Buff. Supp. VII, 78; but the muzzle in the figure is too short. The figure of Hernandez conveys a much better idea of the animal.

it.(1) Their molars, five every where, are individually formed of two vertical laminæ soldered together, and in the upper jaw there is a sixth, simple and very small. They have five toes before and four behind; an enormous cæcum, five or six times the size of the stomach, furnished internally with a spiral fillet, which traverses its length. The inside of their mouth, and the under part of the feet are lined with hairs like the rest of the body.

Lepus, Cuv.

Or the true Hares, have long ears; a short tail; the hind feet much longer than the fore ones; imperfect clavicles, and the infra-orbitary spaces in the skeleton reticulated. The species are so numerous and similar, that it is difficult to characterise them.

L. timidus, L.; Buff. VII, xxxviii. (The Common Hare.) Of a yellowish grey; the ears one-tenth longer than the head; ash coloured behind; black at the tips; tail the length of the thigh, white, with a black line above.

Every one knows this animal, whose dark flesh is excellent food, and whose fur is useful. It lives solitarily, never burrows, sleeps on the open ground, when hunted describes large circles, and has never yet been domesticated.

L. variabilis, Pall., Schreb. CCXXXV, B. (The Variable Hare.) Somewhat larger than the preceding, with rather shorter ears and tail, the latter white at all seasons; the rest of the fur is grey in summer, and white in winter. This animal, which is found in the North, and on the high mountains of the south of Europe, has the habits of the common Hare, but its flesh is insipid.(2)

L. cuniculus, L.; Buff. VI, 1. (The Rabbit.) Less than the Hare; the ears somewhat shorter than the head; tail not so long as the thigh; fur of a yellowish-grey; some red on the neck; throat and belly whitish; ears grey, without any black; some brown on the tail. This animal, said to be originally from Spain, is now found throughout all Europe. It lives in troops, in burrows, to which it flies for shelter when pursued. Its flesh, which is white and agreeable to the palate, differs considerably from that of the Hare. In a domestic state the Rabbit multiplies prodigiously, and varies as to colour and fur.

Other countries furnish several species which can only be

(1) There is even a period when they are shedding their teeth, during which they appear to have three incisors, one behind the other, six in all.

(2) This species inhabits all the northern and colder part of the American continent. *Am. Ed.*

distinguished from that of Europe by the closest attention. Such are the

L. tolai, Gm., Schreb. CCXXXIV. (The Siberian Rabbit.) Which is intermediate between the Hare and Rabbit as to proportions, and which occasionally surpasses the former in size. It makes no burrows, but seeks shelter in the clefts of rocks or other cavities.

L. Americanus and *Braziliensis*, Gm.; *Lepus nanus*, Schreb. CCXXXIV. (The American Rabbit.) Nearly similar in size and colour to the European species; feet reddish; no black on either ears or tail. Nestles in the hollows of trees, up which it sometimes ascends as far as the branches. Flesh soft and insipid.(1)

L. capensis, Gm.; Geoff., Quadr. d'Egypte. (The African Hare.) The ears a fifth longer than the head.; size and colour nearly those of the European species; the feet however are a little longer and somewhat reddish. It appears to be found from one extremity of Africa to the other, at least the one from Egypt does not differ from that of the Cape.

Lagomys, Cuv.(2)

Moderate ears; legs nearly alike; the hole below the eye simple; clavicles nearly perfect, and no tail: they often utter a sharp cry. They have hitherto been found in Siberia only, and it is to Pallas (Glir. p. 1 et seq.) that we are indebted for their discovery.

Lepus pusillus, Pall. Glir. I, Schreb. ccxxxvii. (The Dwarf Lagomys.) Of a greyish brown; the size of a Water-Rat. Lives in small burrows, in fertile countries, on fruit and birds.(3)

Lepus ogotonna, Pall, Glir. III, Schreb. ccxxxix. (The Grey Lagomys.) A very light grey, with yellowish feet; a little larger than the preceding; nestles among heaps of stones, in the fissures of rocks, &c., where it collects hay for the winter.

Lepus alpinus, Pall. Glir. II, Schreb. ccxxxviii. (The Lagomys Pica.) Size of a Guinea-Pig, and of a yellowish red. Inhabits the summits of mountains, where it passes the summer in selecting and drying the plants of which it makes its provision for the winter. Its hay-stacks, which are sometimes six or seven feet high, are a valuable resource for the horses of the sable hunters.

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(1) Add the Black-Necked Rabbit of India, &c.

(2) *Lagomys*, i. e. Rat-Hares.

(3) Pallas describes another still smaller species from the north-eastern extremity of Asia, *Lepus hyperboreus*, Zoog. Russ. I, 152.

The fossil bones of an unknown species of Lagomys have been discovered in the osseous breccia of Corsica. Cuv. Oss. Foss. IV, p. 199.

After the two genera of Porcupines and Hares, come the Rodentia, united by Linnæus and Pallas, under the name of Cavia; but to which it is impossible to affix any other common and positive character than that of their imperfect clavicles, although the species of which they are composed are very analogous to each other, both in body and habits. They are all from the western continent.

Hydrochœrus, Erxleb.

Four toes before and three behind, all armed with large nails, and united by membranes; four grinders throughout, of which the posterior are the longest, and composed of numerous, simple and parallel laminæ; the anterior laminæ, forked towards the external edge in the upper, and towards the internal one in the lower teeth. Only one species is known, the

H. capybara; Cavia capybara, L.; *Capybara*, Marcg.; *Capiygoua*, Azzar.; *Cabiai*, Buff. XII, xlix. (The Capybara.) Size of Siam Pig; the muzzle very thick; legs short; hair coarse, and of a yellowish brown; no tail. Inhabits the rivers of Guiana and the Amazon, where it lives in troops. The Beaver only approaches it in size.

Cavia, Illig.—Anœma, Fr. Cuv.

The Cobayes, or Guinea-Pigs, are miniature representations of the Cabiais; but their toes are separated, and each of their molars has only one simple lamina, and one that is forked on the outside in the upper ones, and on the inside in the lower. The species best known,

C. cobaia, Pall.; *Mus porcellus*, L.; Buff. VIII, i, (The Guinea-Pig) is now very common in Europe and America, where it is brought up in houses, because its odour is thought to drive away Rats. Like all domesticated animals, it varies in colour. There is reason for believing it proceeds from an American animal called *Aperea*, which is of the same size and form, but with a uniform reddish-grey fur. It is found in the woods of Brazil and Paraguay.

Kerodon, Fred. Cuv.

The Mocos have rather simpler grinders than the Cobayes, each being formed of two triangular prisms.

The only species known is also from Brazil, somewhat surpasses the Guinea-Pig in size, and is of an olive-grey.

Chloromys, Fr. Cuv.—Dasyprocta, Illig.

The Agoutis have four toes before and three behind; four grinders throughout, almost equal, with flat crowns irregularly furrowed, rounded borders notched on the internal edge in the upper jaw, and on the external one in the lower. In disposition, and in the nature of their flesh, they resemble Hares and Rabbits, which they may be said to replace in the Antilles and hot parts of America.

C. acuti; Cavia acuti, L.; Buff. VIII, l, 1. (The Common Agouti.) The tail reduced to a simple tubercle; fur brown. The male fawn coloured on the croup; as large as a Hare.

C. acuchi; Cavia acuchi, Gm.; Buff. Supp. III, xxxvi. (The Acouchi.) Six or seven vertebræ in the tail; brown above, fawn coloured beneath; size of a Hare.

C. patagonicus; Cavia patagonica, Penn. and Schreb.; the *Pampas Hare* of the Creoles of Buenos Ayres. This animal appears to be a species of Agouti, with longer ears, and a very short naked tail; but its molars are not known.

Cœlogenys, Fr. Cuv.(1)

The Pacas, in addition to teeth very like those of the Agoutis, have a very small toe on the internal edge of the fore foot, and one on each side, equally small on their hinder one, making five toes every where. Besides this, there is a cavity formed in their cheek which dips under the border formed by a very large and projecting zygomatic arch,(2) which gives a very extraordinary aspect to the bony head. Their flesh is said to be very good.

There is one species or variety fawn coloured, and another brown, both of which are spotted with white, the *Cavia paca*, L.; Buff. X, xliii; Supp. III, xxxv.

Finally, there remains an animal perhaps nearly allied to the Cavias, and possibly more so to the Lagomys or the Rats, which we are unable to dispose of, on account of our ignorance of its teeth: I mean the *Chinchilla*, thousands of whose skins are to be had, but of which we have never yet been able to procure the entire body. It

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(1) *Anœma*, without strength; *Chloromys*, yellow rat; *Dasyprocta*, hairy buttock; *Cœlogenys*, hollow cheek; *Hydrochœrus*, water-pig.

(2) Dr Harlan (Faun. Americ., p. 126) has made a new genus from a head preserved in the Philadelphia Museum, which he names *Osteopera*; but from the description, it appears to us to be nothing more than that of the Paca. Desmarets has already made the same observation.

is about the size of a small Rabbit; is covered with long, close and fine hair, the softest that is known among common furs. The ears are large and half naked; the tail, one-third the length of the body, is furnished with stiffer hairs, so arranged as to give it the appearance of being laterally compressed. The fore feet have four toes with a vestige of a thumb; the hinder ones have only three. This quadruped inhabits the mountains of South America.

The *Viscache*, as described by Azzara (Quadr. du Parag., Tr. Fr. II, p. 41), and such as we have seen it figured, can hardly be any other than a large species of *Chinchilla*, with shorter and coarser fur.(1)

ORDER VI.

EDENTATA.

The Edentata, or quadrupeds without front teeth, will form our last order of unguiculated animals. Although united by a character purely negative, they have, nevertheless, some positive mutual relations, and particularly large nails, which embrace the extremities of the toes, approaching more or less to the nature of hoofs: a slowness, a want of agility, obviously arising from the peculiar organization of their limbs. There are, however, certain intervals in these relations, which render it necessary to divide the order into three tribes. The first of these is the

TARDIGRADA.

They have a short face. Their name originates from their excessive slowness, the consequence of a construction truly heteroclite, in which nature seems to have amused herself by producing something imperfect and grotesque. The only genus now in existence is

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(1) The figures were communicated to us by M. Hamilton Smith and M. Brookes. It is the animal described under the name of *Gerboise géante*, by De Blainville, in Desmarets' Mammal., 315, and Nouv. Dict. d'Hist. Nat. XIII, 117, and figured in Griffith's ed. of the present work, under that of Marmot Diana.

Bradypus, Lin.

The Sloths have cylindrical molars, and sharp canini longer than those molars, two mammæ on the breast, and fingers united by the skin, and only marked externally by enormous compressed and crooked nails, which, when at rest, are always bent towards the palm of the hand, or the sole of the foot. The hind feet are obliquely articulated on the leg, and rest only upon their outer edge; the phalanges of the toes are articulated by a close ginglymus, and the first, at a certain age, become soldered to the bones of the metacarpus or metatarsus, which also, in time, for want of use, experience the same fate. To this inconvenience in the organization of the extremities is added another, not less great, in their proportions. The arm and fore-arm are much longer than the thigh and leg, so that when these animals walk, they are compelled to drag themselves along on their elbows. The pelvis is so large, and their thighs so much inclined to the sides, that they cannot approximate their knees. Their gait is the necessary effect of such a disproportioned structure.(1) They live in trees, and never remove from the one they are on until they have stripped it of every leaf, so painful to them is the requisite exertion to reach another. It is even asserted that to avoid the trouble of a regular descent, they let themselves fall from a branch. The female produces but a single young one at a birth, which she carries on her back.

The viscera of these animals are not less singular than the rest of their conformation. The stomach is divided into four sacks, analogous to the four stomachs of the Ruminantia, but without leaflets or other internally salient parts, while the intestinal canal is short, and without a cæcum.

M. Fr. Cuvier applies the name of Acheus to those species that have three nails to the fore feet; they have a very short tail.

Bradypus tridactylus, L.; Buff. XIII, v and vi. (The Ai.) A species in which sluggishness and all the details of the organization which produce it are carried to the highest degree. The thumb and the little toe, reduced to small rudiments, are hidden under the skin, and soldered to the metatarsus and metacarpus; the clavicle, also reduced to a rudiment, is firmly

(1) M. Carlisle has observed that the arteries of the limbs commence by splitting into an infinitude of ramifications, which afterwards unite in one trunk, from which the usual branches proceed. This structure being met with in the *Loris*, whose gait is almost equally sluggish, it is possible that it may exert some influence on this slowness of motion. Independently of this, the Loris, the Ourang-Outang, the Coaita, all very slow animals, are remarkable for the length of their arms.

united to the acromion. The arms are double the length of the legs; the hair on the head, back, and limbs is long, coarse, and non-elastic, something like dried hay, which gives it a most hideous aspect. Its colour is grey, the back being frequently spotted with white and brown. It is as large as a Cat, and is the only mammiferous animal known which has nine cervical vertebræ.

There is an Aï called the *Dos brulé*, from the circumstance of having between the shoulders a black spot, surrounded with fawn colour; but, according to Temminck, it is only a variety; the appearance alluded to resulting from the wearing away of the long hair on the shoulder. The *Black Collared Aï*, however,—*Brad. torquatus*, Geoff. Ann. Mus., Schreb. LXXIV, A, is a species that is very distinct, even in the bony structure of the head.

M. Fr. Cuvier applies the name of Bradypus to those species only which have two nails to the fore feet, the Cholæpus, Illig. Their canini are larger and more pointed, and they are wholly destitute of a tail. There is but one known.

B. didactylus, L.; Buff. XIII, i. (The Unau.) Which is somewhat less unfortunately organized than the Aï. Its arms are not so long, and its clavicles are complete; there are fewer bones of the feet and hands which become soldered together; the muzzle is more elongated, &c. It is larger than the Aï by one half, and is of a uniform greyish-brown, which sometimes has a reddish tint.

These two animals are natives of the hot parts of America, and, long ere this, would probably have been destroyed by the numerous Carnivora of that country, had they not possessed some means of defence in their nails.(1)

Fossil skeletons of two Edentata of great size have been

(1) It is singular that the *B. didactylus* was not known before the time of Seba, and that for a long time naturalists obstinately persisted in referring it, on the authority of that ignorant collector, to Ceylon. Erxleben has maintained its African origin, having mistaken it for the Poto of Bosmann, which is a Galago. (See this last genus.) It is a fact that the Unau is only found in South America.

Shaw, Gen. Zool., under the name of *Brad. ursinus*, has described an animal of which Illiger has made his genus Prochylus. M. Buchanan, Trav. in the Mysore, Vol. II, p. 198, has shown it to be a true Bear, and in fact we have satisfied ourselves by inspecting the cranium of the very individual described by Shaw, that it was a Bear of the species termed thick-lipped, which had lost its incisors. See *Ursus*, &c.

discovered in America, one of which, the MEGATHERIUM, Cuv. Oss. Foss. tom. v, part i, p. 174, has a head very similar to that of the Sloths, but deficient as to canini, and approaching in other parts of the skeleton, partly to the Sloths, and partly to the Ant-eaters. It is twelve feet long, and six or seven high. The other, the MEGALONYX, Ib. p. 160, is rather smaller, and the toes are the only parts of it that are well known, but they strongly resemble those of the preceding.

The second tribe comprehends the

EDENTATA ORDINARIA.

Or the Ordinary Edentata with a pointed muzzle. Some of them still have cheek teeth. They form two genera.

DASYPUS, Lin.

The Armadillos(1) are very remarkable among the Mammalia, by the scaly and hard shell formed of compartments resembling little paving stones, which covers their head and body, and frequently their tail. This substance forms one shield over the forehead, a second very large and convex over the shoulders, a third on the croup similar to the second, and between the two latter several parallel and movable bands, which allow the body to bend. The tail is sometimes furnished with successive rings, and at others, like the legs, merely with tubercles. These animals have large ears, and sometimes four, and at others five great nails before, but always five behind. The muzzle is pointed, the grinders are cylindrical, seven or eight in number throughout, separated from each other, and without enamel on the inside. The tongue is smooth, and but slightly extensible, and there are a few scattered hairs between their scales, or on those parts of the body not covered by the shell. They dig burrows, and live partly on vegetables, and partly on insects and dead bodies; their stomach is simple, and there is no cæcum. They all belong to the hot, or at least to the temperate parts of America.

They may be divided into subgenera from considerations drawn from the structure of their fore feet and the number of their teeth. Most of them have only four toes to the anterior feet, the two middle ones of which are the longest. Of this number is the

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(1) *Tatou* is their Brazilian name. The Spaniards called them *Armadillo*, from their armour; the Portuguese, *Encuberto*, for the same reason. They are also called *quirquincho*. *Dasypus* (hairy feet) was one of the Grecian appellatives of the Hare or Rabbit.

CACHICAMUS, Cuv.

Which has only seven teeth on each side, and in each jaw. The muzzle is pointed; the tail long, and encircled with bony rings.

Dasypus novemcinctus, L.; *Cachichame*, Buff. X, xxxvii; *Tatou à longue queue*, Id. Supp. III, lviii; *Tatuete*, Schreb. lxxiii; *Tatupeba*, Marcg. (The Nine-banded Armadillo.) With nine, sometimes eight intermediate bands, generally blackish; the body fifteen inches in length, and the tail the same.

Das. 7-cinctus; Schreb. LXXII; *Tatou mulet*, Azzar. (The Seven-banded Armadillo.) But seven bands, and is smaller; its tail also is proportionably shorter. Those of the

APARA, Cuv.,

Have the toes of the Cachicami, and nine or ten teeth throughout.

Das. tricinctus, L.; *Tatou Apara*, Marcg.; *Apar*, Buff.; *Mataco*, Azzar.; Schreb. LXXI, A. (The Three-banded Armadillo.) Three intermediate bands; tail very short, and the compartments regularly tuberculated. By enclosing its head and feet between its plates, it possesses the faculty of rolling itself into a complete ball, like certain species of Oniscus. It is from Paraguay and Brazil, and is one of those found farthest to the south. Size, middling. In other Tatous, such as the

ENCOUBERTUS, Cuv.,

There are five toes to the fore feet, the three middle of which are the longest. The greater part of their tail is covered with scales, arranged in quincunx. There are nine or ten teeth throughout. In this subdivision is

Dasyp. sexcinctus and *octodecimcinctus*, L.; *Encoubert* and *Cirquinson*, Buff.;(1) *Tatou poyou*, Azzar.; Buff. X, xlii, and Supp. III, xlii. (The Six-banded Armadillo.) Distinguished from all the rest of the genus by having a tooth on each side in the intermaxillary bone. The shell has six or seven bands; its compartments are large, smooth and angular; the tail is of a middling length, and annulated only at the base; there are five toes to each foot. The *Pichiy* of Azzara resembles this species, except that there are no intermaxillary teeth, that its posterior shield is denticulated, and that the parts not defended by the

(1) The *Weasel-headed Tatou* of Grew; *Cirquinson* of Buff.; *Das. octodecimcinctus*, L., is the *Encoubert*, or *Six-banded Armadillo;* but Grew considered the rows of scales on the croup as movable. If we count them we shall find but sixteen, and his own figure exhibits no more.

shell are furnished with longer and more thickly set hairs. A neighbouring species is the *Hairy Tatou* of Azzara. A third subdivision of the Tatous, or the

Cabassous, Cuv.,

Has five toes to the fore feet, but directed obliquely, so that the thumb and index are slender, and the latter the longest; the middle one has an enormous trenchant nail; the following one has also a nail, but a shorter one, and the last toe is the shortest of all. This form of the foot enables these animals to divide the earth, and burrow into it with rapidity, or at any rate to cling to it with such tenacity that it is extremely difficult to tear them from it. They have but eight or nine teeth on each side, and in each jaw.

Das. unicinctus, L.; *Le Cabassou propre*, Buff.; *Tatouay*, Azz. (The Tatouay.) Twelve intermediate bands; the tail long and tuberculous; the compartments of the bands and shields square, broader than long; five toes every where, of which the four anterior have enormous nails with trenchant external edges. It attains a great size.

Priodon, Fr. Cuv.

The toes more unequal, and the nails more enormous than in the preceding subgenus; twenty-two to twenty-four small teeth throughout, or ninety-four or ninety-six in all. Such is the

Dasypus gigas, Cuv.; *Tatou géant*, Geoff.; *Great Tatou*, Azzar.; *Deuxième Cabassou*, Buff. X, xlv. (The Giant Armadillo.) Twelve or thirteen intermediate bands; the tail long, and covered with tiled scales; the compartments square, more broad than long. It is the largest of the Tatous, being sometimes more than three feet in length, exclusive of the tail.

Finally, we should place after the Tatous, as a very distinct subgenus, the

Clamyphorus, Harl.,

Which has ten teeth throughout, and five toes to each foot; the nails of the fore feet very large, crooked and compressed, furnishing, as in the Cabassous, a powerfully trenchant instrument. The back is covered with a suite of transverse rows of scaly plates, without any solid shell before or behind, forming a sort of hauberk which is only connected with the body along the spine. The hinder part of the body is truncated, and their curved tail partially attached to the under part of the body.(1). One species only is known, the

(1) We only know this animal by the description of Dr Harlan, Ann. of the New York Lyc. I, p. 235 and pl. xxi.

C. truncatus, Harl.(1) which is five or six inches in length, and is found in the interior of Chili, where it passes the most of its time under ground.

It appears that the fossil bones of a *Tatou* of gigantic size, being ten feet long exclusive of the tail, have been found in America. See Cuv. Oss. Foss. V. part 1, p. 191, note.

Orycteropus, Geoff.(2)

The animals of this genus were for a long time confounded with the Ant-Eaters on account of their using the same kind of food, having a similar head, and a tongue somewhat extensible ; but they are distinguished from them by being furnished with grinders and flat nails, formed for digging and not trenchant. The structure of their teeth differs from that of all other quadrupeds; they are solid cylinders traversed like reeds, in a longitudinal direction, with an infinitude of little canals. Their stomach is simple, and muscular near the pylorus, their cæcum small and obtuse. There is only one species known.

Oryct. capensis ; Myrmecophaga capensis, Pall.; Buff. Supp. VI, xxxi. (The Cape Ground-Hog.) So called by the Dutch of that colony. It is an animal about the size of the Badger or larger ; stands low; has short hair, and is of a brownish-grey. The tail is not so long as the body, and is covered with equally short hairs. It has four toes before, and five behind. Inhabits burrows, which it excavates with great facility. The flesh is eaten.

The other ordinary Edentata have no grinders, and consequently no teeth of any description. They also form two genera.

Myrmecophaga, Lin.

The Ant-Eaters are hairy animals with a long muzzle terminated by a small toothless mouth, from which is protruded a filiform tongue susceptible of considerable elongation, and which they insinuate into Ant-hills and the nests of the Termites, whence these Insects are withdrawn by being entangled in the viscid saliva that covers it. The nails of the fore feet, strong and trenchant, and varying in number according to the species, serve to tear up the nests of the Termites, and afford the means of defence. When at rest, these nails are

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(1) Its osteology, as given by M. Yarrel, (Zool. Journ. No. 12,) is closely allied to that of the Cabassous. Over each eye-brow there is a singular ridge.

(2) *Orycteropus*, feet fitted for digging.

always half bent inwards, resembling a callosity of the tarsus ; hence the animal can only bring the side of the foot to the ground. The stomach of the Ant-Eaters is simple and muscular towards its pylorus ; their intestinal canal moderate, and without a cæcum.(1)

They all inhabit the hot and temperate parts of the western continent, and produce but a single young one at a birth, which they carry on their back.

M. jubata ; Buff. X, xxxix, and Supp. III, lv. (The Tamanoir.) More than four feet long, with four nails before and five behind ; the tail is furnished with long hairs vertically directed, both above and beneath ; the fur is of a greyish-brown, with an oblique black band edged with white on each shoulder. It is the largest of the Ant-Eaters ; and it is asserted that it even defends itself against the Jaguar. It inhabits low places, never climbs trees, and moves slowly.

M. tamandua, Cuv.; *M. tetradactyla*, and *M. tridactyla*, L.; Schreb. LXVI. (The Tamandua.) The form and feet of the preceding, but not half its size ; the tail, on which the hair is short, is prehensile and naked at the end, and enables the animal to suspend itself to the branches of trees. Some of them are of a yellowish-grey, with an oblique band on the shoulder that is only visible in a certain light ; others are fawn coloured with a black band ; some are fawn coloured and striped, with the croup and belly black ; and finally, some are entirely blackish. Whether these differences are specific or not, is as yet unknown.

M. didactyla, L.; Buff. X, xxx. (The Two-toed Ant-Eater.) The size of a Rat, with woolly hair, fawn coloured ; a red line along the back ; the tail is prehensile, and naked at the end ; only two nails before, one of which is very large, four behind.(2)

Manis, Lin.

The Pangolins,(3) or Scaly Ant-Eaters as they are called, are destitute of teeth, have a very extensible tongue, and live on Ants and Termites like true Ant-Eaters ; but their body, limbs and tail are clothed

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(1) Daubenton has discovered in the *M. didactyla* two very small appendages, which, in strictness, may be considered as cæca. I have ascertained that there are none in the Tamandua.

(2) The *Myrme. tridactyla*, L.; Seba, pl. F, is a Tamandua, badly drawn. The *M. striata*, Shaw, Buff. Supp. III, pl. lvi, is a Coati, disfigured by the stuffer.

(3) *Pangoeling*, according to Seba, in the language of Java signifies an animal that rolls itself into a ball. In Bengal, it is called *Badjarkita* or Stone Reptile ; it is also called the *Land Carp*. The Dutch sailors called it the *Devil of Formosa*.

with large trenchant scales arranged like tiles, which they elevate in rolling themselves into a ball, when they wish to defend themselves from an enemy. There are five toes to each foot. Their stomach is slightly divided in the middle, and there is no cæcum. They are confined to the eastern continent.

M. pentadactyla, L.; *M. brachyura*, Erxl.; Buff. X, xxxiv. (The Short-tailed Pangolin.) Three or four feet long; the tail shorter than the body. From the East Indies. It is the *Phattagen* of Ælian, lib. xvi, cap. vi.

M. tetradactyla, L.; *M. macroura*, Erxl.; *Phatagin*, Buff. X, xxxiv. (The Long-tailed Pangolin.) Three or four feet in length; the tail double that of the body, and the scales armed with points. From Senegal, Guinea, &c.(1)

The third tribe of the Edentata comprehends those animals, designated by M. Geoffroy, under the name of

MONOTREMATA.

So called, because they have only one external opening for the seminal fluid, urine and other excrements. Their organs of generation present extraordinary anomalies; for though they have no pouch under the belly, their pubis is furnished with the same supernumerary bones as the Marsupialia; the vasa deferentia terminate in the urethra which opens into the cloaca; the penis, when at rest, is drawn into a sheath, which opens by a hole near the bottom of the cloaca. The only matrix consists of two canals or trunks, each of which opens separately and by a double orifice into the urethra, which is very large and terminates in the cloaca. As naturalists have not yet agreed as to the existence of their mammæ;(2) whether they are oviparous or viviparous remains to be ascertained.(3) The singularities of their skeleton are not

(1) We have verified the habitat of the Long-tailed Pangolin, by the statement of M. Adanson and other travellers.

(2) M. Meckel considers as such two glandular masses he found greatly developed in a female Ornithorhynchus. M. Geoffroy thinks they are rather glands, analogous to those on the flanks of the Shrews.

(3) Travellers have lately asserted, that it has been ascertained that these animals produce eggs. Should this prove to be the case, the Monotremata must, in some sort, be considered as a separate class of animals; but it is to be wished that some able anatomist would exactly describe these eggs, their internal origin, and their development after being produced. We must expect it from some one

less remarkable; a sort of clavicle especially, which is common to both shoulders, placed before the ordinary clavicle, and analogous to the fourchette in birds. Finally, besides their five nails to each foot, the males have a spur on the hinder ones, perforated by a canal which transmits the liquid secreted by a gland situated on the inner surface of the thigh. It is asserted that the wounds it inflicts are envenomed. These animals have no external conch to their ears, and their eyes are very small.

The Monotremata are only found in New Holland, and have been discovered since the settlement of the English. Two genera of them are known.

Echidna, Cuv.—Tachyglossus, Illig.

The elongated slender muzzle of the Spiny Ant-Eaters, terminated by a small mouth, contains an extensible tongue similar to that of the Ant-Eaters and Pangolins, and like them, they feed on Ants. They have no teeth, but their palate is furnished with several rows of small recurved spines. Their short feet have each five very long and stout nails fitted for digging; and the upper surface of the body is covered with spines like that of the Hedgehog. It appears, that when in danger, they also possess the faculty of rolling themselves into a ball. Their tail is very short; their stomach ample and almost globular, and their cæcum moderate; the penis is terminated by four tubercles. There are two species.

E. hystrix; Ornithorhynchus hystrix, Home; *Myrmecophaga aculeata*, Shaw. (The Spiny Echidna.) Completely covered with large spines.

E. setosa; Ornithor. setosus, Home. (The Bristly Echidna.) Is covered with hair, among which the spines are half hidden. Some naturalists consider it as a mere variety from age.

Ornithorhynchus, Blumenb.—Platypus, Shaw.

The elongated, and at the same time singularly enlarged and flattened muzzle of the Ornithorhynchi presents the closest external resemblance to the bill of a Duck, and the more so as its edges are

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among the numerous physicians who daily visit the colony of Port Jackson. As to the anatomy of the Ornithorhynchus, see the detailed monography on that subject, published by M. Meckel, also the Memoirs of Sir Ev. Home, my Lessons of Comparative Anatomy, Vol. V, and the Memoirs of M. Geoffroy St Hilaire, Mem. du Mus. tome XV.

similarly furnished with small transverse laminæ. They have no teeth except at the bottom of the mouth, where there are two throughout, without roots, with flat crowns, and composed like those of the Orycteropus, of little vertical tubes. There is a membrane to the fore feet, which not only unites the toes, but extends far beyond the nails; in the hind feet the membrane terminates at the root of the nails; two characters, which, with the flattened tail, make them aquatic animals. Their tongue is in a manner double: one in the bill bristled with villosities; and a second on the base of the first, which is thicker, and furnished anteriorly with two little fleshy points. The stomach is small, oblong, and has the pylorus near the cardia. The cæcum is small; and many salient and parallel laminæ are visible in the intestines. The penis has only two tubercles. The Ornithorhynchi inhabit the rivers and marshes of New Holland in the neighbourhood of Port Jackson.

Two species only are known, one with smooth, thin, reddish fur, the *Ornithorhynchus paradoxus*, Blumenb., and the other with blackish-brown, flat and frizzled hair. Probably these are only varieties of age. Voy. de Peron, I, pl. xxxiv.

ORDER VII.

PACHYDERMATA.

The Edentata terminate the series of unguiculated animals, and we have just seen that there are some of them whose nails are so large, and so envelope the extremities of the toes, as to approximate them in a certain degree to the hoofed animals. They still, however, possess the faculty of bending these toes round various objects, and of seizing with more or less force. The total deficiency of this faculty characterizes the hoofed animals. Using their feet merely as supporters, they are never furnished with clavicles; their fore-arm is always in a state of pronation, and they are reduced to the necessity of feeding on vegetables. Their forms and habits present much less variety than those of the Unguiculata, and they can hardly be divided into more than two orders, those which ruminate, and those which do not; but these latter,

which we designate collectively by the term *Pachydermata*, admit of subdivision into families.

The first is that of the Pachydermata which have a proboscis and tusks.

FAMILY I.

PROBOSCIDIANA.(1)

The Proboscidians have five toes to each foot, very complete in the skeleton, but so encrusted by the callous skin which surrounds the foot, that their only external appearance is in the nails attached to the edge of this species of hoof. They have no canini or incisors properly so called, but in their incisive bone are implanted two tusks, which project from the mouth, and frequently attain to an enormous size. The magnitude requisite for the alveoli of these tusks renders the upper jaw so high, and so shortens the bones of the nose, that the nostrils in the skeleton are placed near the top of the face; but in the living animal they are continued out into a cylindrical trunk or proboscis, composed of several thousands of small muscles, variously interlaced, extremely flexible, endowed with the most exquisite sensibility, and terminated by an appendage resembling a finger. This proboscis is to the Elephant what the hand is to the Monkey. With it he seizes every thing he wishes to convey to his mouth, and sucks up the water he is to drink, which, by the flexure of this admirable organ, is then poured into his throat, thus supplying the want of a long neck, whose weakness would have rendered it unable to support so large a head and such heavy tusks. Within the parietes of the cranium, however, are several great cavities, which render the head lighter; the lower jaw has no incisors whatever; the intestines are very voluminous, the stomach simple, cæcum enormous, and

(1) The Proboscidians have various affinities with certain Rodentia: 1, their great incisors; 2, their grinders frequently composed of parallel laminæ; 3, the form of several of their bones, &c.

the mammæ, two in number, placed under the chest. The young suck with the mouth, and not with the trunk.

But one living genus of the Proboscidiana is known, that of

Elephas, Lin.

Or the Elephant, which comprehends the largest of the terrestrial Mammalia. The astonishing nature of his trunk, an instrument at once agile and powerful, the organ of touch as well as of smell, forms a singular contrast with his clumsy aspect and heavy proportions; and as this is joined to a very imposing physiognomy, it has contributed to exaggerate the intelligence of these animals. After studying them for a long time, we have not found it to surpass that of the Dog, or of several other carnivorous animals. Naturally of a mild disposition, Elephants live in herds, which are conducted by old males. Their food is strictly vegetable.

Their distinctive character consists in the grinders, the bodies of which are composed of a certain number of vertical laminæ, each one being formed of a bony substance, enveloped with enamel, and cemented together by a third substance, called cortical; in a word, similar to those we have already seen to exist in the Cabiais and other Rodentia. These grinders succeed each other, not vertically, or as our permanent teeth succeed the first ones, but from behind forwards, so that as fast as one tooth becomes worn, it is pushed forward by that which comes after it; hence it happens that the Elephant has sometimes one, sometimes two grinders on each side, or four or eight in all, according to circumstances. The first of these teeth are always composed of fewer laminæ than those which replace them. It is asserted that certain Elephants thus shed their teeth eight times—their tusks, however, are changed but once.

The Elephants of the present day, clothed with a rough skin nearly destitute of hair, are only found in the torrid zone of the eastern continent, where hitherto only two species have been ascertained.

E. indicus, Cuv.; Buff. XI, i, and Supp. III, lix. (The Elephant of India.) An oblong head; the crown of the grinders presenting transverse undulating fillets, which are sections of the laminæ which compose them worn by trituration. This species has rather smaller ears than the next one, and has four nails to the hind foot. It is found from the Indus to the Eastern ocean, and in the large islands in the south of India. They have been used from the earliest ages as beasts of draught and burden, but it has hitherto been found impossible to make them propagate in a domestic state, although the assertion respecting their modesty and repugnance to copulate before witnesses is

wholly without foundation. The females have very short tusks, and in this respect, many of the males resemble them.

E. africanus, Cuv.; Perrault, Mem. pour l'Hist. des An., and F. Cuv. Mammif. (The African Elephant.) A round head; convex forehead; large ears; the crowns of the grinders divided into lozenges; it appears very frequently to have but three nails to the hind foot. Found from Senegal to the Cape of Good Hope. Whether they ascend the eastern coast of Africa, or whether they are replaced there by the preceding species is not known. The tusks of the female are as large as those of the male, and the weapon itself, generally speaking, is larger than in the Indian species. The African Elephant is not now tamed, though it appears that the Carthaginians employed it in the same way that the inhabitants of India do theirs.

In nearly every part of the two continents, are found, under ground, the bones of a species of elephant allied to that of India, but with narrower and straighter coronal fillets, the alveoli for lodging the tusks much longer in proportion, and the lower jaw more obtuse. A specimen recently taken from the ice on the coast of Siberia, by Mr Adams, appears to have been thickly covered with hairs of two kinds, so that it is possible this species may have lived in cold climates. It has long disappeared from the face of the earth. See Cuv. Oss. Foss. tom. I.

The second genus of the Proboscidiana, or the

Mastodon, Cuv.

Has been completely destroyed, nor is there a single individual living. It had the feet, tusks, trunk, and many other details of conformation in common with the Elephant; but differed from it in the grinders, the crown of which, from above the gum, being bristled with large conical points, presented in proportion to their detrition, larger or smaller disks, which represented sections of those points.(1) These teeth, which succeed each other from behind, like those of the Elephant, presented also so many more pairs of points as the animal was the more advanced in age.

M. giganteum, Cuv. loc. cit. The Great Mastodon, in which the sections of the points are lozenge-shaped, is the most celebrated species. It equalled the Elephant in size, but with still heavier proportions. Its remains are found in a wonderful state of preservation, and in great abundance throughout all parts of

(1) This conformation, common to the Mastodon, Hippopotamus, Hog, &c., has occasioned the erroneous idea of the first being carnivorous.

North America. They are infinitely more rare in the eastern continent.

M. angustidens, Cuv. loc. cit., or the Narrow-toothed Mastodon, whose grinders, narrower than those of the preceding species, when worn down, formed trefoil-shaped disks, and have thereby been confounded by some authors with the teeth of the Hippopotamus, was a third less than the great Mastodon, and much lower on its legs. Its remains are found throughout the greater part of Europe and of South America. In certain places, the teeth, tinged with iron, become of a beautiful blue when heated, forming what is called the oriental turquoise.(1)

FAMILY II.

PACHYDERMATA ORDINARIA,

Or the ordinary Pachydermata, have four, three or two toes.

Those in which the toes make even numbers have feet somewhat cleft, and approximate to the Ruminantia in various parts of the skeleton, and even in the complication of the stomach. They are usually divided into two genera.

Hippopotamus, Lin.

Four nearly equal toes, terminated by little hoofs, to each foot; six grinders throughout, of which the three anterior are conical; the three posterior bristled with two pairs of points, which, when worn, assume a trefoil shape; four incisors to each jaw, the superior of which are conical and recurved, the inferior cylindrical, long, pointed and sloping forwards; a canine tooth on each side above and below, the superior straight, and the inferior very large and curved, the two rubbing against each other.

These animals have a very massive and naked body; very short legs; the belly reaching nearly to the ground; an enormous head terminated by a large inflated muzzle, which encloses the apparatus of their large front teeth; the tail short; the ears and eyes small. Their stomach is divided into several sacs. They live in rivers,

(1) Other less widely dispersed species have been discovered; see Oss. Foss.: and very lately, some remarkable ones have been brought from the Birmese empire, a description of which we are expecting from M. Buckland, *Mast. latidens*, *M. elephantoides*, &c.

upon roots and other vegetable substances, and exhibit much ferocity and stupidity. One species is only known.

H. amphibius, L.; Buff. Supp. III, 4 and 5. (The Hippopotamus. Now confined to the rivers of the middle and south of Africa. It formerly found its way into Egypt by the Nile, but has long disappeared from that country.

The bones of a species of Hippopotamus very similar to that of Africa, and those of two or three other successively smaller ones, have been found in Europe. See my Rech. sur les Oss. Foss. tom. 1.

Sus, Lin.

Each foot of the Hog consists of two large middle toes armed with strong hoofs, and two much shorter lateral ones that hardly reach the ground; there is a variable number of incisors, the inferior of which always slant forwards; the canini project from the mouth and curve upwards; the muzzle terminates by a sort of truncated button fitted for turning up the earth; the stomach is but slightly divided.

Hogs, properly so called, have twenty-four or twenty-eight grinders, of which the posterior are oblong with tuberculous crowns, and the anterior more or less compressed, and six incisors in each jaw.

S. scropha, L.; Buff. V, xiv and xvii. The Wild Hog, which is the parent stock of our Domestic Hog and its varieties, has prismatic tusks that curve outwards and slightly upwards; the body short and thick; straight ears; the hair bristled and black; the young ones striped black and white. It does great injury to fields in the vicinity of forests, by tearing up the ground in search of roots.

The Domestic Hog varies in size, in the height of its legs, in the direction of its ears, and in colour, being sometimes white, and at others black, red or varied. The great utility of this animal from the facility with which it is fed, the flavour of its flesh, the length of time it can be preserved by means of salt, and finally, from its fecundity, which greatly surpasses that of any other animal of its size, the female frequently producing fourteen at a litter, is well known to every one. The period of gestation is four months, and they produce twice a year. The Hog continues to increase in size for five or six years, is prolific at one, and sometimes lives for twenty. Although naturally savage, they are social animals, and know how to defend themselves against Wolves by forming a circle, and showing a front to the enemy in every direction. Voracious and clamorous, they do not even spare their own young. This species is spread

throughout the globe; and none but Jews and Mahometans refuse to eat its flesh.

S. larvatus, Fr. Cuv.; *S. africanus*, Schreb. CCCXXVII; *Sanglier de Madagascar*, Daub. MDCCCLXXXV; Samuel Daniels, Afric. Scenery. (The Masked Sanglier.) Tusks like the common Hog; but on each side of the snout, near the tusks, is a large tubercle, nearly similar to the mamma of a woman, supported by a bony prominence, which gives it a very singular appearance. It inhabits Madagascar and the south of Africa.

S. babirussa, Buff. Supp. III, xii. (The Babiroussa.) Higher and lighter than the others; the tusks are long, slender, and turned vertically upwards; the upper ones inclining spirally backwards. From some of the islands in the Indian Archipelago. We may separate from the Hogs the

PHACOCHÆRUS, Fred. Cuv.(1)

Grinders composed of cylinders, cemented together by a kind of cortical substance, very similar to the transverse laminæ of those of the Elephant, and like them succeeding each other from behind. The cranium is remarkably large; the rounded tusks, inclined laterally upwards, are of a frightful magnitude; and on each of their cheeks hangs a thick fleshy lobe, which completes the hideousness of their figure. They have only two incisors above, and six below.

Those brought from Cape Verd generally have the incisors very complete—*S. africanus*, Gm.: in such as are from the Cape of Good Hope—*S. æthiopicus*, Gm.; Buff. Supp. III, xi, they are scarcely visible, some vestiges however exist under the gum. This difference may arise from age, which may have worn them away in the latter, or it may indicate a different species, more especially as the head of those from the Cape of Good Hope is somewhat larger and shorter.

With still more propriety do we separate from the Hogs the

DICOTYLE, Cuv.(2)

Or the Pecaries, which have, it is true, grinders and incisors very similar to those of the Hog properly so called, but their canini, directed like those of animals in general, do not project from the mouth, and they have no external toe to their hind foot. There is no tail, and upon the loins is a glandular opening from which a fetid humour is excreted. The metatarsal and metacarpal bones of their two great toes are soldered together like those of the Ruminantia,

(1) *Phaco-chærus*, Hog with a wart.

(2) *Dicotyle*, double navel, from the opening on the back.

to which their stomach, divided into several sacs, evidently allies them. It is singular that the aorta of these animals is often found very much enlarged, but at different parts of it, as though they were subject to a kind of aneurism.

Only two species are known, both from South America, which were ascertained by Azzara: Linnæus confounds them under the name of *Sus tajassu.*

Dic. torquatus, Cuv.; Buff. X, iii and iv. (The Patira.) Hair annulated with grey and brown; a whitish collar, stretching obliquely from the angle of the lower jaw over the shoulder; half the size of the Wild Hog.

Dic. labiatus, Cuv.; the *Tagniacati*, *Taitetou*, *Tajassou*, &c.; larger, brown, and with white lips.

Here may come a genus now unknown in the living creation, which we have discovered, and named

Anoplotherium.

It presents the most singular affinities with the various tribes of the Pachydermata, and approximates in some respects to the order of the Ruminantia. Six incisors to each jaw, four canini almost like the incisors, and not projecting beyond them, and seven molars throughout, form a continuous series without any intervening space, a disposition of the teeth seen in Man only. The four posterior molars of each side are similar to those of the Rhinoceros, the Daman, and the Palæotherium; that is, they are square above, and form double or triple crescents below. Their feet, terminated by two great toes, as in the Ruminantia, differ in this—the bones of the metatarsus and metacarpus always remain separate, or without being soldered together. The composition of their tarsus is the same as in the Camel.

The bones of this genus have hitherto only been found in the gypsum quarries near Paris. We have already ascertained five species: one the size of a small Ass, with the low form and long tail of the Otter—*A. commune*, Cuv., to the internal edge of whose fore foot was affixed a small accessary toe: another of the size and light carriage of the Gazelle—*A. medium:* a third of the size, and about the proportions of the Hare, with two small accessory toes to the sides of the hind feet, &c. See Cuv. Rech. Oss. Fos. tom. III.

The ordinary Pachydermata which have not cloven feet, comprehend, in the first place, three genera, very similar to

each other in their grinders, having seven upper ones on each side, with a square crown and various salient lines, and seven lower ones, the crown of which forms a double crescent, and the last of all a triple one; but their incisors vary.

Rhinoceros, Lin.

The species of this genus, in this particular, even vary among themselves. They are large animals; each foot is divided into three toes, and the bones of the nose, which are very thick, and moulded into a sort of arch, support a solid horn which adheres to the skin, and is composed of a fibrous and horny substance, resembling agglutinated hairs. They are naturally stupid and ferocious, frequent marshy places, and feed on herbs and branches of trees. Their stomach is simple, intestines very long, and the cæcum extremely large.

Rh. indicus, Cuv.; Buff. XI, vii. (The Rhinoceros of India.) Has, in addition to its twenty-eight grinders, two strong incisors in each jaw, two other small ones between the lower, and two still smaller again outside of the upper ones. It has but one horn, and the skin is remarkable for the deep folds into which it is thrown behind and across the shoulders, and before and across the thighs. It inhabits the East Indies, and chiefly beyond the Ganges.

Rh. javanus, Cuv.; Fr. Cuv. Mammif. (The Rhinoceros of Java.) With the large incisors and single horn of the preceding, has not so many folds in the skin, though one of them on the neck is larger; but what is most remarkable, is, that the whole skin is covered with small compact angular tubercles. It has hitherto been found in Java only.

Rh. sumatrensis, Cuv.; Bell. Philos. Trans. 1793; F. Cuv. Mammif. (The Rhinoceros of Sumatra.) The same four great incisors as the preceding, but there are scarcely any folds of the skin, which moreover is hairy, and has a second horn behind the first.

Rh. africanus, Cuv.; Buff. Supp. VI, vi. (The Rhinoceros of Africa.) Furnished with two horns, like the preceding; has no fold of the skin, nor any incisor teeth, its molars occupying nearly the whole length of the jaw. This deficiency of incisors might warrant its separation from its congeners.

There have been found, under ground, in Siberia, and in different parts of Germany, the bones of a two-horned Rhinoceros, the cranium of which, besides being much more elongated than that of any living species, is also distinguished by a bony ver-

tical partition that supported the bones of the nose. It is a lost species; and a nearly entire body, which was taken from the ice on the banks of the Vilhoui in Siberia, showed that it was covered with tolerably thick hair. It is possible then that its habitat was to the north, like that of the fossil Elephant.

In Tuscany, and in Lombardy, there have been disinterred, still more recently, other Rhinoceros bones, which seem to approximate much nearer to that of Africa.

Some have been found in Germany with incisors like the Asiatic species; and lastly, some of their bones have been discovered in France, which announce a size hardly superior to that of the Hog.

Hyrax, Herm.

The Damans, as they are termed, have long been placed among the Rodentia, on account of their small size; if, however, we examine them closely, we shall find, the horn excepted, that they are Rhinoceroses in miniature, at least they have similar molars; but their upper jaw is furnished with two strong incisors curved downwards, and at an early age with two very small canini; the lower one has four incisors, but no canini. There are four toes to the fore feet, and three to the hind one, all except the internal posterior, which is armed with a hooked and oblique nail, terminated by a kind of very small, thin, and rounded hoof. The muzzle and the ears are short; they are covered with hair, and have a tubercle in lieu of a tail. Their stomach is divided into two sacs, and besides a large cæcum and several dilatations of the colon, there are two appendages about the middle of the latter analogous to the two cæca of birds.

There is one species known which is as large as a Rabbit, of a greyish colour, and tolerably common among the rocks of all Africa, where it frequently becomes the victim of birds of prey, and which also appears to inhabit some parts of Asia; at least we cannot perceive any certain difference between the *Hyrax capensis* and the *H. syriacus*, Buff. Supp. VI, xlii, xliii, and VII, lxxix.(1) The

Palæotherium, Cuv.,

Is also a lost genus, with the same grinders as the two preceding, six incisors, and two canini in each jaw, like the Tapirs, and three

(1) I have strong doubts of the authenticity of the *Hyrax hudsonius*, Bewick, 407, and Schreb. CCXL, c. It has only been seen in a Museum.

visible toes to each foot; they had also, like the Tapirs, a short fleshy proboscis, for the muscles of which the bones of the nose were shortened, leaving a deep notch underneath. We discovered the bones of this genus pêle-mêle with those of the Anoplotherium in the gypsum quarries near Paris. They also exist in many other parts of France.

Eleven or twelve species are known already. At Paris alone we find them of the size of a Horse, of a Tapir, and of a small Sheep, while near Orleans are found the bones of a species that must have been as large as the Rhinoceros. These animals appear to have frequented the shores of lakes and marshes, for the rocks which conceal their bones also contain fresh water shells. See Cuv., Oss. Foss., tom. III. The

Lophiodon, Cuv.,

Is another lost genus, which appears to be closely allied to the preceding one; its inferior grinders, however, have transverse ridges. Ten or twelve species have been extracted from our old fresh water formations, the same in which the Palæotherium is found. See my Oss. Foss., tom. III.

To these genera should succeed the genus

Tapir, Lin.,

In which the twenty-seven molars, before they are worn, present two transverse and rectilinear prominences; in front, there are, in each jaw, six incisors and two canini, separated from the molars by an empty space. The nose resembles a small fleshy proboscis; there are four toes to the fore feet, and three to the hind ones. For a long time but a single species was known,

T. americanus, L.; Buff. Supp. VI, i. (The American Tapir.) Size of a small Ass; skin brown and nearly naked; tail moderate; neck fleshy, forming a sort of crest on the nape. Common in wet places, and along the rivers of the warm parts of South America. The young ones are spotted with white like the fawn. The flesh is eaten.

Within a few years a second species has been discovered in the eastern continent.

T. indicus, Farkharie, Soc. Asiat., tom. XIV; Horsfield, Jav. *Miaba*, Fr. Cuv. Mammif. (The Tapir of India.) Larger than that of America, of a black-brown; the back of a whitish grey. It inhabits the forests of Malacca, Sumatra, &c.

Fossil Tapirs are also scattered throughout Europe; and among others is a gigantic species, which in size must have

nearly equalled the Elephant; *Tap. giganteus*, Cuv., Oss. Foss. tom. II.(1)

FAMILY III.

SOLIPEDES.

The Solipedes are quadrupeds which have only one apparent toe, and a single hoof to each foot, although under the skin, on each side of their metatarsus and metacarpus, there are spurs representing two lateral toes. One genus only is known, that of

Equus, Lin.,

The Horse has six incisors in each jaw, the crowns of which, at an early age, are marked with a fossula, and six molars throughout, with a square crown, marked by laminæ of enamel which dip into them, with four crescents, and in the upper ones, with a small disk on the inner edge. The male has also two small additional canini in the upper jaw, and sometimes in both, which are almost always wanting in the female. Between these canini and the first molar is that unoccupied space which corresponds to the angle of the lips where the bit is placed, by which alone Man has been enabled to subdue and tame this powerful animal. The stomach is simple and moderate, but the intestines are very long, and the cæcum enormous. The mammæ are between the thighs.

E. caballus, L.; Buff. IV, i. (The Horse.) This noble associate of Man, in the chase, in war, and in the works of agriculture, the arts and commerce, is the most important and carefully attended of all the animals he has subdued. It does not seem to exist in a wild state at the present time; those places excepted, where Horses formerly domesticated have been set at liberty, as in Tartary and America, where they live in troops, each of which is led and defended by an old male. The young

(1) Dr Roulin has lately discovered in the Cordilleras a new species of Tapir, black, and covered with hair; the bones of its nose are more elongated, which somewhat approximates it to the Palæotherium.

M. Schleyermacher has obtained a lower jaw bone of the great fossil animal that was supposed to be a gigantic Tapir. It turns out that it is possessed of enormous canini which must have projected from the mouth; consequently, it must form a separate genus. Its size may have been greater than that of the Hippopotamus by one half.

males, forcibly expelled as soon as they have reached the age of puberty, follow the troop at a distance, until they are joined by some of the younger mares.

The domestic colt sucks six or seven months, and the sexes are separated at two years; at three they are handled, and at four broken to the saddle, &c. at which time also they can propagate without injury to themselves. The period of gestation is eleven months.

A Horse's age is known by the incisors. The milk teeth begin to grow about fifteen days after the colt is foaled; at two years and a half the middle ones are replaced; at three and a half the two following ones; at four and a half the outermost or the *corners*. All these teeth, with an originally indented crown, gradually lose that mark by detrition. When seven or eight years old they are entirely effaced, and the Horse is no longer marked.

The lower canini are produced at three years and a half, the upper ones at four; they remain pointed till six; at ten they begin to peel off.

The life of the Horse seldom extends beyond thirty years.

Every one knows how much this animal varies in size and colour. The principal races even exhibit sensible differences in the form of the head, in their proportion, and in their fitness for the various uses to which they are applied.

The most beautiful and swift is the Arab, which has been instrumental in improving the Spanish race, and along with the latter has contributed to form the English; the largest and strongest are from the coasts of the North sea; the smallest from the north of Sweden and Corsica. Wild Horses have a large head, frizzled hair, and ungraceful proportions.

E. hemionus, Pall., Schreb. (The Dzigguetai.) A species which, as to its proportions, is intermediate between the Horse and the Ass, and lives in troops in the sandy deserts of central Asia. It is of an isabella or light bay colour, with a black mane, and a dorsal line of the same colour; the tail is terminated by a black tuft. It is probably the Wild Mule of the ancients.

E. asinus, L.; Buff. IV, xi. (The Ass.) Known by its long ears, the tuft which terminates the tail, and the black cross on the shoulders, which is the first indication of the stripes which distinguish the following species. Originally from the great deserts of central Asia, it is still to be found there in a wild state, and in innumerable troops, ranging from north to south according to the season; hence it thrives but poorly in the more northern climates. Its patience, sobriety, robust tem-

perament, and the services it renders, are all too well known to need a comment. The hoarseness of its voice, or bray, depends upon two small peculiar cavities situated at the bottom of the larynx.

E. zebra, L.; Buff. XII, i. (The Zebra.) Nearly the same form as the Ass; the whole animal regularly marked with black and white transverse stripes, originally from the whole south of Africa. We have seen a female Zebra successively produce with the Horse and the Ass.

E. quaccha, Gm., Buff. Supp. VII, vii. (The Couagga.) Resembles the Horse more than the Zebra, but comes from the same country. The hair on the neck and shoulders is brown, with whitish transverse stripes; the croup is of a reddish grey; tail and legs whitish. The name is expressive of its voice, which resembles the barking of a Dog.

E. montanus, Burchell; the *Onagga* or *Dauw*, Fred. Cuv. Mammif. (The Onagga.) An African species, smaller than the Ass, but having the beautiful form of the Couagga; its colour is a light bay, with black stripes, alternately wider and narrower, on the head, neck and body. Those behind slant obliquely forwards; legs and tail white.

ORDER VIII.

RUMINANTIA.(1)

This order is perhaps the most natural and best determined of the class, for nearly all the animals which compose it have the appearance of being constructed on the same model, the Camels alone presenting some trifling exceptions to the general characters.

The first of these characters is the total absence of incisors in the upper jaw, they being found only in the lower one, and nearly always eight in number. A callous pad is substituted for them above. Between the incisors and the molars is a vacant space, where, in some genera only, are found one or two canini. The molars, almost always six throughout, have their

(1) The Pecora, Lin.

crown marked with two double crescents, the convexity of which is turned inwards in the upper, and outwards in the lower ones.

The four feet are terminated by two toes and two hoofs which face each other by a flat surface presenting the appearance of a single hoof which has been cleft, whence the name of cloven-footed, bifurcated, &c. which is applied to these animals.

Behind the hoof are sometimes found two small spurs, the vestiges of lateral toes. The two bones of the metatarsus and metacarpus are united into one called the *cannon*, but in certain species there are also vestiges of lateral metatarsal and metacarpal bones.

The term Ruminantia indicates the singular faculty possessed by these animals of masticating their food a second time, by bringing it back to the mouth after a first deglutition. This faculty depends upon the structure of their stomachs, of which they always have four, the three first being so disposed that the food may enter into either of them, the œsophagus terminating at the point of communication.

The first and largest is called the *paunch;* it receives a large quantity of vegetable matters coarsely bruised by a first mastication. From this it passes into the second, called the *honeycomb* or *bonnet*, the parietes of which are laminated like a honeycomb. This second stomach, very small and globular, seizes the food, moistens and compresses it into little pellets, which afterwards successively ascend to the mouth to be re-chewed. The animal remains at rest during this operation, which lasts until all the food first taken into the paunch has been submitted to it. The aliment thus re-masticated descends directly into the third stomach called the leaflet, (*feuillet*) on account of its parietes being longitudinally laminated or like the leaves of a book; and thence to the fourth or the caillette, the sides of which are wrinkled, and which is the true organ of digestion, analogous to the simple stomach of animals in general. In the young Ruminantia, or so long as they subsist on the milk of the mother, the caillette is the largest of the four. The paunch is only developed by receiving increased quantities of grass, which finally give it

an enormous volume. The intestinal canal is very long, though there are but few enlargements in the great intestines. The cæcum is likewise long and tolerably smooth. The fat of ruminating animals hardens more by cooling than that of other quadrupeds, and even becomes brittle. It is called tallow. Their mammæ are placed between the thighs.

Of all animals, the Ruminantia are the most useful to man. They furnish him with food, and nearly all the flesh he consumes. Some serve him as beasts of burden, others with their milk, their tallow, leather, horns, &c. The two first genera have no horns.

Camelus, Lin.

The Camels approximate to the preceding order rather more than the others. They not only always have canini in both jaws, but they also have two pointed teeth implanted in the incisive bone, six inferior incisors and from eighteen to twenty molars only; peculiarities, which, of all the Ruminantia, they alone possess, as well as that of having the scaphoid and cuboid bones of the tarsus separate. Instead of the large hoof flattened on its internal side which envelopes the whole inferior portion of each toe, and which determines the figure of the common cloven-foot, they have but one small one, which only adheres to the last phalanx, and is symmetrically formed liked the hoofs of the pachydermata. Their tumid and cleft lip, their long neck, prominent orbits, weakness of the crupper, and the disagreeable proportions of their legs and feet, render them somewhat deformed, but their extreme sobriety and the faculty they possess of passing several days without drinking, make them of the highest importance.

The faculty just mentioned probably results from the large masses of cells which cover the sides of their paunch, in which water is constantly retained or produced. The other Ruminantia have nothing of the kind.

The Camel urinates backwards, but the direction of the penis changes *in coitu*, which is effected with much difficulty, and while the female lies down. In the rutting season a fetid humour oozes from their head.

Camelus, Cuv.

Camels, properly so called, have the two toes united below nearly to the point by a common sole, and the back furnished with lumps of fat. They are large animals of the eastern continent, of which

two species are known, both completely reduced to a domestic state.(1)

C. bactrianus, L.; Buff. XI, xxii. (The Two-Humped Camel.) Originally from central Asia, and which descends to the south much less than the

C. dromedarius, L. Buff. XI, ix. (The One-Humped Camel.) Which has spread from Arabia into all the north of Africa, a great part of Syria, Persia, &c.

The first is the only one employed in Turkestan, Thibet, &c.; it is sometimes led as far as lake Baïcal. The second is well known for crossing the desert, and as the only means of communication between the countries which border on it.

The two-humped Camel walks with less difficulty than the other in humid grounds; it is also larger and stronger. At the regular period it sheds the whole of its hair. It is the single-humped Camel that is the most abstemious. The *Dromedary*, properly speaking, is a lighter variety of it, and better calculated for expedition.

The flesh and milk of the Camel serve as food, and its hair for garments, to the people who possess it. In stony countries both species are useless.

Auchenia, Illig.

In the Lamas the two toes are separate; they are without humps. But two distinct species are known, both from the western continent, and much smaller than the two preceding ones.

Camelus llacma, L.; *Guanaco*, Buff. Supp. VI, xxvii. (The Lama.) As large as a Stag; the hair coarse and of a chesnut colour, but varying when domesticated. It was the only beast of burden in Peru at the time of the conquest. It can carry a hundred and fifty pounds, but makes short journeys. The *Alpaca* is a variety with long woolly hair.

Cam. vicunna, L.; Buff. Supp. VI, xxviii. (The Paco.) The size of a sheep, covered with fawn coloured wool, extremely soft and fine, of which valuable stuffs are manufactured.

Moschus, Lin.

The Musks are much less anomalous than the Camels, differing from the ordinary Ruminantia only in the absence of horns, in hav-

(1) Pallas, on the authority of the Buchares and Tartars, states, that in the deserts of central Asia wild Camels are still to be found; we must recollect, however, that the Kalmuks are in the habit of giving freedom to all sorts of animals from a religious principle.

ing a long canine tooth on each side of the upper jaw, which in the male issues from the mouth, and finally in having a slender peronæus, which is not found even in the Camel. These animals are remarkably light and elegant.

M. moschiferus, L.; Buff. Supp. VI, xxix. (The Musk.) This is the most celebrated species, and the size of a Goat, has scarcely any tail, and is completely covered with hairs so coarse and brittle that they might be termed spines. What particularly distinguishes it, however, is the pouch situated before the prepuce of the male which produces that odorous substance so well known by the name of musk. This species appears to belong to that rugged and rocky region from which descend most of the Asiatic rivers, and which is spread out between Siberia, China and Thibet. Its habits are solitary and nocturnal, its timidity extreme. It is in Thibet and Tunkin that it yields the best musk; in the north, it is almost inodorous.

The other Musks have no musk-pouch, and inhabit the warm parts of the eastern continent;(1) they are the smallest and the most elegant of all the Ruminantia.(2)

All the rest of the Ruminantia, the males at least, have two horns, that is to say, two prominences of the frontal bones which are not found in any other family of animals.

In some, these prominences are covered with an elastic sheath composed as if with agglutinated hairs, which increases by layers and during life; the name of *horn* is applied to the substance of this sheath, and the sheath itself is called the *corne creuse*. The prominence it envelopes grows with it, and never falls. Such are the horns of *Oxen, Sheep, Goats* and *Antelopes*.

In others, the prominences are only covered with a hairy skin, continuous with that of the head; nor do the prominences fall, those of the Giraffe excepted.

Finally, in the genus of the Stags, the prominences covered for a time with a hairy skin, similar to that on the rest of the

(1) The *Moschus americanus* established from Séba, is merely the young or the female of one of the Guiana Deer. The same may be said of the *M. delicatulus* of Shaw, Schreb. 245, D. It is the fawn of an American Deer.

(2) *Moschus pygmæus*, Buff. XII, xiii.—*Moschus memina*, Schreb. CCXL, iii.—*Moschus javanicus*, Buff. Supp. VI, xxx.

head, have at their base a ring of bony tubercles, which, as they enlarge, compress and obliterate the vessels of that skin. It becomes dry and is thrown off; the bony prominences, being laid bare, at the expiration of a certain period separate from the cranium to which they were attached; they fall and the animal remains defenceless. Others, however, are re-produced generally larger than before, and destined to undergo the same fate. These horns, purely osseous, and subject to periodical changes, are styled *antlers*.

Cervus, Lin.

The Stags, consequently, are the only Ruminantia which have heads armed with antlers; the females, however, the Rein-Deer alone excepted, are always without them. The substance of these antlers, when completely developed, is that of a dense bone without pores or sinus. Their figure varies greatly according to the species, and even in each species at different ages. These animals are excessively fleet, live commonly in the forest, and feed on leaves, buds, grasses, &c.

We distinguish in the first place those species whose antlers are either wholly or partially flattened, viz.

C. alces, L.; *Elk* or *Elend*, in the north of Europe; *Moose-Deer* of the Americans; *Original* of the Canadians; Buff. Supp. VII, lxxx. (The Moose.) As large as a horse and sometimes larger; stands very high; the muzzle cartilaginous and inflated; a sort of goitre, or pendulous swelling, variously shaped, under the throat; hair always very stiff and of a more or less deep ash-colour. The antlers, at first simple, (*en dague*,) and then divided into narrow slips, assume, in the fifth year, the form of a triangular blade, denticulated on the external edge and mounted on a pedicle. They increase with age so as to weigh fifty or sixty pounds, and to have fourteen branches to each horn. The Moose lives in small troops, and inhabits the marshy forests of the north of both continents. Its skin is valuable for various purposes.

C. tarandus, L., Buff. Supp. III, xviii, *bis*. (The Rein-Deer.) Size of a Stag, but has shorter and stouter legs; both sexes have antlers, divided into several branches, at first slender and pointed, and terminating by age in broad denticulated palms; the hair, which is brown in summer, becomes white in winter.(1)

(1) It is probably owing to this change that the ancients were induced to believe that the *tarandus* could assume any colour it wished.

The Rein-Deer is confined to the glacial countries of both continents, and is the animal so highly celebrated for the services it renders to the Laplanders, who have numerous herds of them which in the summer they lead to the mountains, and in winter bring back to the plains. They are their only beasts of burden and draught; their flesh and milk serve them for food, their skins for clothing, &c.

C. dama, L., Buff. VI, xxvii and xxviii. (The Fallow-Deer.) Less than the Stag; in winter of a blackish brown, in summer fawn coloured, spotted with white; the buttocks always white, bordered on each side with a black stripe; tail longer than the Stag's, black above, white underneath. The horn of the male is round at base, with a pointed antler, and throughout the rest of its length flattened, with the outer edge denticulated. After a certain age it shrinks, and splits irregularly into several slips. This species, which is the *Platiceros* of the ancients, has become very common in all Europe, although it seems to be originally from Barbary.(1) A black variety without spots is sometimes to be found. Those species which have round antlers are more numerous; such as inhabit temperate climates also change their colour, more or less, during the winter.

C. elaphus, L.; Buff. VI, ix, x, xii. (The Common Stag.) A fawn coloured brown in summer, with a blackish line along the spine, and on each side a range of small light yellow spots; in winter of a uniform greyish brown; the crupper and tail always of a pale yellow. It is a native of the forests of all Europe, and of the temperate parts of Asia. The antlers of the male are round, and appear in the second year, at first simple, and then with tines or branches on their inner face, which increase in number as they advance in age, forming a kind of palm with many small points. When very old the Stag becomes blackish, and the hairs on the neck lengthen and stand erect. The horns are shed in the spring, the old ones losing them first; they are reproduced in the summer, during the whole of which period they live separately. When they are grown again, the rutting season commences, at which period the males become furious. Both sexes unite in large herds to pass the winter. The hind carries eight months, and brings forth in May. The fawn is spotted with white.

C. canadensis, Gm.; *C. strongyloceros*, Schreb. 246, A, 247, F, G; *Wapiti*, &c. (The Elk.) A fourth larger than the Elk

(1) Since the publication of the second ed. of my Oss. Foss., we have received a wild *C. dama*, killed in the woods to the south of Tunis.

of Europe, and nearly of the same colour, but the disk of the crupper broader and paler; the antlers equally round, but more developed, and without a palm. Inhabits all the temperate parts of North America.

C. virginianus, Gm.; Schreb. CCXLVII, H. (The Virginia Deer.) Less than the Fallow Deer of Europe, and of a more graceful figure; the muzzle more pointed; of a light fawn colour in summer, reddish-grey in winter; the under part of the throat and tail white at all times; inferior third of the tail black with a white tip. The horns of the male, shorter than in the European species, are round, smooth, whitish, and bend outwards, forming an arc of a circle inwards and forwards; the tines are inserted into their posterior face, that at the base excepted; they sometimes amount to five or six.(1)

The species inhabiting warm climates do not change their colour. There are several of these in South America, of which we have as yet no complete account, nor sufficiently comparative characters. Such are

C. paludosus, Desm.; *Gauzou-Poucou*, or *Great Red Stag*, Azz. It appears to have straighter horns than the preceding; skin of a bright bay, with a black stripe on the forehead, and black rings round the point of the feet. It prefers marshy grounds.

C. campestris, Fr. Cuv.; *Guazouti*, Azz. Antlers short and straight, with tines front and back, which become numerous (Oss. Foss. IV, pl. iii, f. 46—48); fawn coloured; belly, inner sides of the thighs, buttocks and tip of the tail, white.(2)

There are also several in the East Indies.

C. axis, L.; Buff. XI, xxxviii, xxxix. (The Indian Stag or Axis.) Fawn coloured at all times, spotted with pure white; under part of the throat and that of the tail white; tail fawn coloured, edged above with white; round antlers, which become very large with age, but which never have more than one tine near the base, and the point forked. Originally from Bengal, but propagating easily in Europe. It was known to the Romans.

Several other Stags with two tines like the Axis are found in India, which have been distinguished but lately. There is one of them,

C. Aristotelis, Cuv., which has long hairs on the neck and

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(1) See my Oss. Foss. IV, pl. v, f. 1—17. The *Cervus mexicanus*, Penn., and Oss. Foss. pl. v, f. 23, may have been a very old Virginia Stag.

(2) Add *Cervus nemoralis*, Ham. Smith. [Add also *Cerv. macrotis*, Say. *Am. Ed.*]

throat, and which, inhabiting the north of India, must correspond with the Hippelaphus of Aristotle.(1)

C. capreolus, L.; Buff. VI, xxxii, xxxiii. (The Roebuck of Europe.) With but two tines to its antlers; of a fawn coloured grey; buttocks white; without lachrymal sinuses, and scarcely any tail. Some individuals are of a very vivid red, and others blackish. This species lives in couples; inhabits the high mountains of the temperate parts of Europe; sheds its antlers towards the close of autumn, reproduces them during the winter; copulates in November, and is gravid five months and a half. The flesh is held in much more esteem than that of the Deer. There are none in Russia.

C. pygargus, Pall., Schreb. CCLIII. (The Roebuck of Tartary.) Similar to that of Europe, but the horns are more spinous at the base; the hair is longer; and it is almost as large as the Deer. It inhabits the high grounds beyond the Volga.

It appears that there are some Roebucks in America, whose antlers always remain simple or without tines.

C. rufus, F. C.; *Gouazoupita*, Azz. Red; lips, hinder part of the belly, and under part of the tail, white. Canini in both jaws. Inhabits the forest.(2)

We might separate from the other Roebucks certain small species of India, which have sharp canini and antlers supported by pedicles which are covered by hairs on the forehead. Such is

C. muntjac, Gm.; Buff. Supp. VII, xxvi. (The Kijang.) Smaller than that of Europe. Found in small herds at Ceylon and Java(3)

Camelopardalis, Lin.; Buff. Supp. VII, lxxxi.

The Giraffe is characterized in both sexes by conical horns, always covered with a hairy skin, and which are never shed. Their bony nucleus, when young, is articulated with the os frontis by a suture. On the middle of the chanfrin is a tubercle or third horn, broader and much shorter, but likewise articulated by a suture. It is moreover one of the most remarkable animals in existence, from the length of its neck and the disproportioned height of its fore legs. Only one species is known,

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(1) Add the *C. hippelaphus; C. Wallichii; C. Mariannus; C. Lechenaulti; C. Peronii; C. equinus;* and with respect to these species, see my Oss. Foss. tom. IV, and the figure of Hamilton Smith in the work of Griffith.

(2) Add the *Gouazou-Bira* (*C. nemorivagus*, F. Cuv.); the *Nouazou-Apara* (*C. simplicicornis*, Ham. Smith).

(3) Add *C. philippinus*, Ham. Sm.—*C. moschatus*, Id. &c.

C. giraffa, F. Cuv. Mammif. (The Giraffe.) Which is confined to the deserts of Africa, and has short grey hair sprinkled with fawn coloured angular spots, and a small fawn coloured and grey mane. It is the tallest of all animals, for its head is frequently elevated eighteen feet from the ground. Its disposition is gentle, and it feeds on leaves. Heliodorus gives a good description of it, and one or two were brought into Italy in the middle century. Several have lately been sent to Europe from Egypt.(1) The

RUMINANTIA WITH HOLLOW HORNS

Are more numerous than the others, and we have been compelled to divide them into genera from characters of but little importance, drawn from the form of their horns and the proportions of their different parts. To these M. Geoffroy has advantageously added those afforded by the substance of the frontal prominence or the bony nucleus of the horn.

Antilope.(2)

The substance of the bony nucleus of the horns of the Antilopes is solid, and without pores or sinus, like the antlers of the Stag. They resemble the Stags moreover in the lightness of their figure and their swiftness. It is a very numerous genus, which it has been found necessary to divide, and principally according to the form of the horns.

a. Horns annulated, with a double curvature directed forwards, inwards or upwards.

A. dorcas, L.; Buff. XII, xxiii. (The Gazelle.) Round, large and black horns, and the size and graceful shape of the Roebuck; light fawn colour above; white beneath; a brown band along each flank; a tuft of hair on each knee, and a deep pouch in each groin. It inhabits the north of Africa, and lives in large herds, which form a circle when they are attacked, presenting their horns at all points. It is the usual prey of the

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(1) M. Geoffroy Saint Hilaire, from some differences in the spots, and in the curvature of the cranium of the few individuals in Europe, thinks that the Giraffe of Nubia and Abyssinia is not of the same species as that from the Cape.

(2) This name is not ancient; it is a corruption of *Antholops*, a word found in Eustathius, who wrote in the time of Constantine, and which seems to refer to the beautiful eyes of the animal. The common Gazelle was well described by Ælian under the name of *Dorcas*, which is properly that of the Roebuck. He calls it the *Dorcas of Lybia*. *Gazel* is an Arabic word.

Lion and Panther. The soft expression of its eye furnishes numerous images to the Arabian poets.

A. corinna, Gm.; Buff. XII, xxvii. (The Corinna.) Only differs in the horns, which are much more slender. It is perhaps a mere variety of sex.

A. kevella, Gm.; Buff. XII, cclxxv. (The Kevel.) Also very similar; but its horns are compressed at the base, and have a greater number of rings. The only mark in which it is even pretended that it differs from the *Ahu* of Kæmpfer, or the *Tseyrain* of the Persians and Turks, (*A. subgutturosa*, Gm.,) is a slight swelling under the throat of the latter.

A. gutturosa, Pall.; *Deseren* of the Mongoles; *Hoang Yang*, or *Yellow Goat* of the Chinese; Schreb. CCLXXV. Nearly similar colours, and the same kind of horns as the Gazelle properly so called; but it is nearly as large as the *C. dama*, and there is a considerable protuberance in the male produced by the larynx, and a large pouch under the belly. The female has no horns. This species lives in herds, in the barren plains of central Asia, and avoids both the forest and water.

A. euchore, Forster; the *Pouched Gazelle;* Buff. Supp. VI, pl. xxi. (The Springbock.) The south of Africa is filled with herds of this species. It is larger than the Gazelle, but of the same form and colour; it is distinguished by a fold of the skin of the croup covered with white hairs, which opens and enlarges at every bound the animal makes.

A. saïga, Pall.; *Colus* of Strabo; Schreb. CCLXXVI. (The Saïga.) Which inhabits the heaths of the south of Poland and Russia, has horns similar to the Gazelle, but yellowish and transparent. It is as large as the Deer, fawn coloured in summer, and of a whitish grey in winter; its cartilaginous, thick and vaulted muzzle, with very expanded nostrils, compels it to retrograde in feeding. The herd sometimes consists of more than ten thousand individuals.

A. dama, Pall., Acad. of Berl. 1824, pl. iii and iv. (The Nanguer.) Size of the *C. dama;* white; the forehead, neck and part of the back red; horns small and slender. From Nubia and Senegal.(1)

b. Horns annulated, and with a triple curve.

A. cervicapra, Pall., Buff. Supp. VI, xviii and xix. (The An-

(1) The only specimen known to Buffon (tom. XII, pl. xxxiv) was a young one with horns curved simply forwards, which induced him to believe it was the *Dama* of Pliny.

telope of India.) Is also very like the Gazelle, but its horns have a triple flexure. They are used in India as weapons, formed by uniting them pair to pair, with the points facing in opposite directions. They are deficient in the female.

A. addax, Lichtenst.(1) Acad. Berl. 1824, pl. xi, and Ruppel. pl. vii. (The Antelope of Nubia.) Also three curves in its horns, which are longer and more slender than those of the preceding; it is whitish, tinged with grey on the back, and has a large brown spot on the forehead.

c. Horns annulated, with a double curve, but winding in an opposite direction to those of the preceding ones, the points directed backwards.—The DAMALIS *of Smith, in part.*

A. bubalis, L.; *Bubalis* of the ancients; Buff. Supp. VI, xiv; vulg. *the Barbary Cow.* (The Bubalis.) More heavily formed than the others; the head long and thick; as large as the Stag; fawn coloured, except at the end of the tail which is terminated with a black tuft. Common in Barbary.

A. caama, Cuv.; vulg. *Cape Stag* of the Hollanders; Buff. Supp. VI, pl. xv. (The Caama.) Similar to the preceding, but the curves of the horns more angular; the circumference of their base, a band on the bottom of the forehead, a line on the neck, a longitudinal stripe on each leg, and the tip of the tail black. Common at the Cape.

d. Small, straight, or but slightly curved horns, less than the head—in the greater number of species found only on the male.

A. lanata, Desmar.; *Reebock* or *Roebuck* of the Hollanders of the Cape. (The Woolly Antelope.) Somewhat smaller than the C. dama; hair woolly; grey above, white beneath; some black on the external face of the limbs, and at the extremity of the lower jaw.

A. mergens, Blainv.; *Duiker-Bock* of the Hollanders. (The

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(1) M. Lichtenstein gave it this name, under the idea that it is the same as the *Addax* or *Strepsiceros* of Pliny. It is seen on several of the ancient monuments of Egypt.

To this subdivision also belong the *Kevel gris*, F. Cuv. Mammif.—The *Purple Antelope* or *Bonte-Bock* of the Hollanders, (*A. pygarga*) Schreb. CCLXXIII.—The *Black-footed Antelope* or *Pallah*, Sam. Daniels, Afric. Scen. pl. ix (*A. melampus*, Lich.); Schr. 274.—The *Coba*, (*A. senegalensis*) of which we have nothing but the horns, Buff. XII, pl. xxxii, 2, unless it be the same as the *Pallah*.—The *A. suturosa*.—The *A. mytilopes*, H. Smith, and perhaps the *Kob* of Buff. which is probably the *A. adenota*, Ham. Smith.

Plunging Antelope.) A light fawn coloured brown ; some white beneath the under jaw; a black line on the external face of the limbs. It derives its name from the manner in which it plunges into the bushes when pursued.

A. oreotragus, Forst.; *Klip-Springer* of the Hollanders; Buff. Supp. VI, pl. xxii; Schr. 259. (The Rock-Springer.) Distinguished by its stiff brittle hair, which is of a greenish yellow.(1) The smallest Antelopes are comprehended in this division.

A. grimmia, L.; F. Cuv. Mammif. (The Grimme.) Fawn coloured grey; the forehead blackish ; a small tuft of hair on the top of the head.

A. pygmæa, Pall.; F. Cuv. Mammif.(2) (The Guevei.) Ash coloured ; a pale blackish line along each side of the forehead.

e. Annulated horns with a simple curve, the points directed forwards. The Reduncæ *of Smith.*

A. redunca, Buff. XII, pl. xlvi ; Schreb. 265. (The Nagor.) Reddish brown. From Senegal.(3)

f. Horns annulated, straight or but slightly curved, and longer than the head. The Oryx *of Smith, in part.*

A. oryx, Pall.; erroneously termed *Pasan* by Buff. Supp. VI, pl. xvii ; *Cape Chamois* of the Hollanders.(4) (The Oryx.) As large as a Stag, with slender horns two or three feet long, straight, pointed, round, the lower third obliquely annulated and smaller in the female ; hair ash coloured ; head white, barred with black ; a black band on the spine and one on each flank ; a deep chesnut spot on the shoulder, and one on the thighs ; tail long and blackish, and the hairs of the spine directed towards the neck. It is found to the north of the Cape, and in the interior of Africa. The length of its hoofs, which is greater than in the other species, enables it to climb rocks, and it prefers mountainous districts.(5)

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(1) Add *A. quadriscopa*, Ham. Smith.

(2) The figure of Schreb. 260, B, is too red; in that of Shaw, Gen. Zool. Vol. II, Part II, pl. clxxxviii, the horns are too large.

(3) Add the *Ritbock* (*A. eleotragus*).—The *Ourebi* (*A. scoparia*). It is very necessary to observe that many Antelopes, *while young*, have horns of this form bent forwards.

(4) M. Lichtenstein has remarked, that as this Antelope with long straight horns is only found in the south of Africa, it is not probable it is the Oryx. It is rather the following species.

(5) The *A. leucoryx*, Schr. CCLVI, B, or the *White Antelope* of Penn. taken

A. gazella, L.; *Ant. leucoryx*, Licht., Acad. Berl. 1824, pl. i. (The Algazel.) Horns long, slender, and slightly curved into an arc of a circle; hair whitish, variously tinged with a fawn or reddish colour. Found in north Africa, from Nubia to Senegal. It is often sculptured on the monuments of Egypt and Nubia; and M. Lichtenstein thinks it is the true *Oryx* of the ancients.(1)

g. Horns annulated with a simple curve, the points directed backwards.

A. leucophæa, Gm.; improperly called *Tseiran*, Buff. Supp. VI, pl. xx. (The Blue Antelope.) A little larger than the Stag, of a bluish ash colour; large horns in both sexes, uniformly curved, and with upwards of twenty annuli.

A. equina, Geoff. (The Equine Antelope.)(2) As large as a horse; of a reddish grey; brown head; a white spot before each eye; a mane on the neck; large horns, &c.

A. sumatrensis, Shaw; *Cambing-Outang* or *Goat of the Woods* of the Malays; Fr. Cuv. Mammif.; and Marsden, Sumat. 2d Ed. pl. x. (The Antelope of Sumatra.) Size of a large goat; black; a white mane on the neck and withers; the horns pointed and small.(3)

h. Horns encircled with a spiral ridge.

A. oreas, Pall.; *Elk of the Cape* of the Hollanders; improperly called *Coudous* by Buff. Supp. VI, pl. xii. (The Canna or Impooko.) As large as the largest horse; large, conical, straight horns, surrounded by a spiral ridge; hair greyish; a

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from a drawing made in Persia in 1717, appears to be a mere variety of the *Oryx*, or perhaps of an Algazel viewed in front.

(1) The English speak of an Antelope with almost straight horns, stiff hairs woolly at their base, which sometimes loses one of its horns, from the mountains of Thibet, which was pointed out to them as corresponding with the Unicorn, which is one of the supporters of their coat of arms. It is called *Chiru*. M. Ham. Smith thinks it may be the *Kemas* of Ælian, I, xiv, c. 14.

(2) We have definitively ascertained that it is the Equine Antelope which is now called the *Koba* in Senegal. The *A. redunca* or *Nagor* of Buff. is there called the *Mibill*.

(3) Add the *A. goral*, Hardw. Lin. Trans. XIV, pl. xiv, and in the Mammif. F. Cuv. under the name of *Bouquetin de Nepaul;* the *A. sylvicultrix*. There should, also, probably, be added the American woolly species, with long hair and very small horns, (*A. lanigera*, Smith) Lin. Trans. XIII, pl. iv, and perhaps the one Séba represents, I, pl. xlii, x, iii, and which M. Ham. Smith calls *A. mazama*. There is nothing, however, to prove that the *Mazames* of Hernandez are not the Stags and Roebucks of America, as is observed by that author, who compares them to the Stags and Roebucks of Spain.

small mane along the spine; a kind of dewlap under the neck; the tail terminated by a tuft. It lives in troops in the mountains north of the Cape.(1)

i. Horns bifurcated. Antilocapræ *of Ord.*—Dicranoceros *of Ham. Smith.*

Of all the forms of hollow horns this is the most singular; a compressed fork is given off from their base or trunk, almost like the tine or antler of a Deer; the pointed tips curve backwards. The most known species is,

A. furcifera, Ham. Smith, Lin. Trans. XIII, pl. ii; the *Cabril* of the Canadians. It inhabits the vast prairies of the middle and western parts of North America, where it roams in large herds. Its size is about that of the Roebuck; hair thick, undulated and reddish; the tine of the horns is about the middle of the height.(2)

k. Four horns.—Tetracera, *Leach.*

This subdivision, lately discovered in India, was not unknown to the ancients. Ælian speaks of it, XV, c. xiv, by the name of the *Four-horned Oryx:* the anterior pair are before the eyes, the posterior completely behind the frontal.

A. chicarra, Hardw.; Lin. Trans. XIV, pl. xv; and F. Cuv. Mammif.(3) (The Tchicarra.) About the size of a Roebuck, and of an almost uniform fawn colour. The female has no horns. Found in the forests of Hindostan.(4)

l. Two smooth horns.

A. picta, and *trago-camelus*, Gm.; Buff. Supp. VI, pl. x and xi. (The Nylgau.) As large as a Stag or larger; the horns

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(1) Near the *Canna* should be placed the *Guib*, (*A. scripta*) Buff. XII, pl. xl.—The *Bosch-Bock*, (*A. sylvatica*) Buff. Supp. VI, xxv.

(2) The *A. palmata*, Smith, Ib. pl. iii, is only known to me by its horns, which have the antlers close to the base; perhaps they had been cut off. Some authors have considered these Antelopes also as the *Mazames* of Hernandez.

(3) I should remark here, in relation to the observations at page 523, Lin. Trans. tom. XIV, that it was not the fault of the late M. du Vaucel, that the figure and description of the *Tchicarra* were attributed to him in the Hist. des Mammif. His consignments were not always complete; a drawing frequently arrived without any description or explanation, and his premature death prevented him from supplying what was deficient in his memoirs.

(4) The *A. 4-cornis*, Blainv., is only known to me by a cranium, the anterior horns of which are proportionally larger, Jour. de Phys. Aout 1815. Perhaps it is merely a difference arising from age.

short and bent forwards; a beard under the middle of the neck; hair greyish; double, black and white, strongly marked rings on all the feet just above the hoof. The female has no horns. This species is from India.

A. rupicapra, L.; Buff. XII, pl. xvi; *Ysard* in the Pyrenees. (The Chamois.) The only ruminating animal in the west of Europe that can be compared with the Antelope, having however peculiar characters: its straight horns are bent suddenly backward like a hook; behind each ear, under the skin, is a sac, whose only external opening is a small orifice.(1) Its size is that of a large Goat. The hair is of a deep brown, with a black band descending from the eye towards the muzzle. The swiftness of its course among rocks and precipices is wonderful, and it remains in small herds in the middle region of the highest mountains.

M. Smith separates from the Antelopes, under the generic name of CATOBLEPAS, the

A. gnu, Gm.; Buff. Supp. VI, pl. viii and ix. (The Gnou.) A very singular being, which, at the first glance, seems to be a monster composed of parts of different animals. It has the body and croup of a small Horse, covered with brown hairs; the tail furnished with long white hairs, like that of the Horse, and on the neck a beautiful straight mane, the hairs of which are white at the base and black at the tip. The horns, approximated and enlarged at the base like those of the Cape Buffalo, descend outwardly, and turn up at the point; its muzzle is large, flat, and surrounded with a circle of projecting hairs; under the throat and dewlap is another black mane; the feet have all the lightness of the Stag's. Horns in both sexes. Inhabits the mountains to the north of the Cape, where it is rather rare, although the ancients appear to have had some knowledge of it.(2)

The three remaining genera have the bony core of the horns principally occupied with cells, which communicate with the frontal sinuses. The direction of their horns furnishes the characters of the divisions.

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(1) It was perhaps a mistaken idea respecting the indication of this orifice which led the ancients to say, that, according to Empedocles, Goats breathed through the ears.

(2) This species most probably gave rise to the *catoblepas*. See Pliny, lib. VIII, cxxxii, and Ælian, lib. VII, c. v.

The most complete work on the subject of the Antelopes is that of M. Ham. Smith, inserted in the work of Griffith, and I regret that the want of sufficient subjects for observation have prevented me from giving all its details.

Capra, Lin.

The horns of the Goats are directed upwards and backwards; the chin generally furnished with a long beard, and the chanfrin almost always concave.

C. ægragus, Gm.; Cuv. Menag. du Mus. 8vo, II, 177. (The Ægagrus or Wild Goat.) Appears to be the stock of all the varieties of our Domestic Goat. It is distinguished by its horns, trenchant in front, very large in the male; short, or altogether wanting in the female, which is also sometimes the case in the two species of Ibex. It lives in herds on the mountains of Persia, (where it is known by the name of *paseng*,) and perhaps on those of other countries, even in the Alps. The oriental bezoar is a concretion found in its intestines.

The Goats, and our domestic species (*Capra hircus*, L.) vary infinitely in size, colour, and in the length and fineness of the hair; in the size of the horns, and even in their number. The Angora Goats in Cappadocia have the longest and most silky hair. Those of Thibet are renowned for the admirably fine wool which grows among their hair, with which the celebrated Cachemires are manufactured. There is a race in upper Egypt with short hair, convex chanfrin, and projecting lower jaw, which possibly is hybrid. The Goats of Guinea, called *Mambrines* and *Whida*, are very small, the horns inclining backwards. All these animals are stout, capricious, and fond of wandering; sensible of their mountain origin, they prefer dry and wild places, feeding on coarse grass and shoots of young trees. They do much injury to the forests. The Kid only is eaten, but their milk is useful in several diseases. The female can produce at seven months; her period of gestation is five, and she generally has two kids at a birth.

C. ibex, L.; Buff. XII, pl. xiii; Schreb. CCLXXXI. (The Ibex.) Large horns, square in front, marked with transverse and prominent knots. It inhabits the most elevated summits of the highest ranges of mountains in the whole of the eastern continent.

C. caucasica, Guldenst., Act. Petrop. 1779, II, pl. xvi, xvii; Schr. CCLXXXI, B. (The Caucasian Ibex.) Distinguished by its large triangular horns, obtuse, but not square in front, and knotty like those of the preceding. The two species mix with the Domestic Goat.(1)

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(1) Add the *Bouquetin d'Ethiopie*, F. Cuv. Mammif.—The *African Maned Ibex, Tuckhaitse*, S. Daniels, Afric. Scenery, pl. xxiv.

Ovis, Lin.

The horns of Sheep are directed backwards, and then incline spirally, more or less forwards: the chanfrin is more or less convex, and there is no beard. They are so slightly entitled to a generic separation from the Goats, that the two produce a prolific offspring. As in the Goats, there are several wild races or species very nearly allied.

Ov. ammon, L.; Pall. Spic. XI, i; Schr. CCLXXXVIII. (The Argali of Siberia.) The male of which has very large horns, with the base triangular, angles rounded, flattened in front, and striated transversely; those of the female are compressed and falciform. In summer the hair is short, and of a fawn coloured grey; in winter it is thick, rigid, and of a reddish grey, with some white about the muzzle, throat, and under the belly. There is always, as in the Stag, a yellow space about the tail, which is very short. This animal inhabits the mountains of all Asia, and attains to the size of the Fallow Deer.

Ov. musimon, Pall.; *Mufione* of Sardinia; *Muffoli de Corse*; Buff. XI, pl. xxix; Schreb. CCLXXXVIII, A. (The Mouflon of Sardinia.) Appears to differ from it only in its inferior size, and in the deficiency or smallness of the horns in the female. It is said to be also found in Crete. There are some varieties, totally or partially black, and others more or less white. It is probable that the

Ov. montana; Geoff., Ann. Mus. II, pl. lx; Schr. CCXCIV, D, (The Mouflon of America) is a species of Argali, which may have crossed the sea on the ice. Its horns are very stout, and are more perfectly spiral than those of the common species.(1)

Ov. tragelaphus, Cuv.; Penn. XII; Shaw, pl. ccii, 2; Schr. CCLXXXVIII, B. (The Mouflon of Africa.) Soft and reddish hair, with a long mane hanging under the neck and another at each ankle; the tail is short; it appears to be a distinct species. It inhabits the rocky districts of all Barbary; and M. Geoffroy has observed it in Egypt.

It is from the Mouflon or the Argali that we are supposed to derive the innumerable races of our woolly animals, which, next to the Dog, are most subject to vary. We have some of them in Europe, with common and fine wool; large and small; with big or little horns, wanting in the females, and in both sexes, &c. &c. The most interesting varieties are those of

(1) This is indubitably identical with the *Ovis ammon*, L. *Am. Ed.*

Spain, which have a fine curly fleece, with large spiral horns on the male, now beginning to be diffused throughout Europe, and that of England, whose wool is fine and long.

The most common variety in southern Russia has a very long tail. Those of India and of Guinea, which also have long tails, are distinguished by their long legs, very convex foreheads, pendent ears, want of horns, and short hair.

The north of Europe and of Asia has almost every where a breed of small Sheep with a very short tail. In the race of Persia, Tartary, and China, the tail is transformed into a double globe of fat; in that of Syria and Barbary it is long, but loaded with an immense mass of the same substance. In both the ears are pendent, the horns of the males large, those of the females moderate, and the wool is mixed with hair.

Sheep are valuable for their flesh, suet, milk, skin, and wool; well managed flocks are every where the sources of wealth. Lambs are weaned at two months, and shed their milk teeth between the first and third year. The period of gestation is five months, and two lambs are produced at a birth.

Bos, Lin.

The horns of the Ox are directed laterally, inclining upwards or forwards, in the form of a crescent; it is a large animal, with a broad muzzle, short and thick body, and stout legs.

B. taurus, L.; Buff. IV, xvi. (The Common Ox.) Its specific characters are a flat forehead, longer than broad, and round horns, placed at the extremities of the salient line or ridge which separates the forehead from the occiput. In the fossil crania, which appear to have belonged to this species in a wild state, (the *Urus* of the ancients) the horns curve forwards and downwards; but in the numberless domestic varieties, they have very different directions, and are of as many sizes—sometimes they are even totally wanting. The common races of the torrid zone have, all, a lump of fat upon the shoulders, and some of them are not larger than the Hog. The utility of these animals for labour, and the value of their flesh, fat, milk, hide, and horns are known to every one. The period of gestation is nine months.

B. urus, Gm.; *Urus* or *Bison* of the ancients; *Zubr* of the Polanders; Gesn. CLVII. (The Aurochs.) Generally, but erroneously, considered as the wild stock of our horned cattle. It is distinguished from them by its convex forehead, which is wider than it is high, by the insertion of its horns below the occipital crest, by the length of its legs, by an additional pair

of ribs, by a sort of curly wool, which covers the head and neck of the bull, forming a short beard under the throat, and by its grunting voice. It is a savage animal that has now taken refuge in the great marshy forests of Lithuania, of the Krapacs and of Caucasus, but which formerly inhabited all the temperate parts of Europe. It is the largest quadruped proper to Europe.

B. bison, L.; *B. americanus*, Gm.; Buff. Supp. III, v; F. Cuv. Mammif. (The Buffalo or Bison of America.) The bony head very similar to that of the Aurochs, and covered like it, the neck and shoulders also, with frizzled wool, which becomes very long in winter; its legs and tail are shorter. Inhabits all the temperate parts of North America.

B. bubalus, L.; Buff. XI, xxv; *Wild Ox of Arachosia*, of Aristotle. (The Buffalo.) Originally from India, and brought into Egypt, Greece, and Italy during the middle century; has a convex forehead, higher than wide, the horns directed sideways, and marked in front by a longitudinal ridge. This animal is subdued with difficulty, but is extremely powerful, and prefers the marshy grounds, and coarse plants on which the Ox could not live. Its milk is good, and the hide very strong, but the flesh is not esteemed.

There is a race of them in India, whose horns include a space of ten feet from tip to tip: it is called *Arni* in Hindostan, and is the *Bos arni* of Shaw.

B. frontalis, Lambert, Linn. Trans. VII, pl. 4; and F. Cuv. Mammif. (The Gyall.) Resembles the domestic Ox in the greater part of its characters, but its horns are flattened from before backwards, and are without angular ridges. They are directed sideways and more or less upwards, but not backwards. The hair is short and black, except on the forehead, and on a line along the back, where it is grey or fawn-coloured, and on the legs, where it is white. It is a domestic race in the mountain districts of the north-west of India, and which is perhaps descended from the Buffalo and the common species.

B. grunniens, Pall.; *Horse-tailed Buffalo; Grunting Cow of Tartary*, &c.; Sch. CCXCIX, A. B. (The Yack.) A small species, with the tail completely covered with long hairs like that of the Horse, and a long mane on the back. Its head appears to resemble that of the Buffalo, but the horns have not been sufficiently described. This animal, of which Ælian has spoken, is originally from the mountains of Thibet. Its tail constitutes the standards still used by the Turks to distinguish the superior officers.

B. caffer, Sparm.; Schr. CCCI. (The Cape Buffalo.) Very

large horns, directed outwards and downwards, ascending from the point, flattened, and so wide at their base that they nearly cover the forehead, merely leaving between them a triangular space, the point of which is above. It is a very large animal, of an excessively ferocious disposition, inhabiting the woods of Caffraria.

B. moschatus, Gm.; Schr. CCCII; *La Tête*, Buff. Supp. VI, iii. (The Musk Ox of America.) The horns approximated and similarly directed, but meeting on the forehead in a straight line; those of the female are smaller and more widely separated; the forehead is convex, and the end of the muzzle furnished with hairs. It stands low, and is covered with tufted hair that reaches to the ground. The tail is extremely short. It diffuses more strongly than any other species the musky odour common to all the genus. It is only to be met with in the coldest parts of North America, though it seems that its cranium and bones have been carried by the ice to Siberia. The Esquimaux make caps of the tail, the hairs of which, falling over their face, defend them from the Musquitoes.

ORDER IX.

CETACEA.

The Cetacea are mammiferous animals without hind feet; their trunk is continued by a thick tail, terminating in an horizontal, cartilaginous fin, and their head is united to the trunk by a neck, so thick and short, that no diminution of its diameter can be perceived, and composed of very slender cervical vertebræ, which are partly anchylosed or soldered together. The first bones of the anterior extremities are shortened, and the succeeding ones flattened and enveloped in a tendinous membrane, which reduces them to true fins. Their external form is altogether that of fishes, the tail fin excepted, which in the latter is vertical. They always therefore remain in the water; but as they respire by lungs, they are compelled to return frequently to its surface to take in fresh supplies of air. Independently of this, their warm blood, their ears,

with external, though small, openings, their viviparous generation, the mammæ with which they suckle their young, and all the details of their anatomy sufficiently distinguish them from fishes.

Their brain is large, and its hemispheres well developed; the petrous portion of the cranium which contains the internal ear is separated from the rest of the head, and only adheres to it by means of ligaments. There are no external ears, nor hairs upon the body.

The form of their tail compels them to flex it from above downwards to produce a progressive motion; it also greatly aids them in rising in the water.

To the genera of the Cetacea hitherto admitted, we add others formerly confounded with the Morses.

FAMILY I.

CETACEA HERBIVORA.

The teeth of these animals have flat crowns: this determines their mode of life, and the latter induces them to leave the water frequently, to seek for pasture on shore. They have two mammæ on the breast, and hairy mustachios; two circumstances which, when observed from a distance as they raise the anterior part of the body vertically from the water, may give them some resemblance to human beings, and have probably occasioned those fabulous accounts of Tritons and Sirens which some travellers pretend to have seen. Although in the cranium the bony nostrils open towards the top, the orifices in the skin are pierced at the end of the muzzle. Their stomach is divided into four sacs, of which two are lateral, and they have a large cæcum.

Manatus, Cuv.

The Lamantins, or rather the Manati, have an oblong body, terminated by an elongated oval fin; the grinders, eight in number throughout, have a square crown, marked with two transverse elevations; there are no incisors nor canini in the adult; but when very young, we find two very small pointed teeth in the intermaxillary bones,

which soon disappear. Vestiges of nails are discoverable on the edges of their fins, which they employ with tolerable dexterity in carrying their young, and in creeping; hence the comparison of these organs with hands, and the name of *Manatus* applied to the animal, of which *Lamantin* is a corruption. From their manner of living, they are also called *Sea Cows*, &c., and from their mammæ, *Mermaids*, &c.—*Trichechus manatus*, Lin.; Buff. XIII, lvii.

They are found near the mouths of rivers in the hottest parts of the Atlantic Ocean, and it appears that those of the American rivers are specifically different from those of Africa.(1) They grow to the length of fifteen feet. Their flesh is used as food.

Halicore, Illig.(2)—Dugong, Lacep.

Grinders composed of two cones laterally united; the teeth implanted in the incisive bone are permanent, and increase to such an extent as to become true pointed tusks, but covered by thick fleshy lips, bristled with mustachios. The body is elongated, and the tail terminated by a crescent-shaped fin. One species only is known, the

Hal. dugong; Siren; Sea Cow, &c.; Renard, Poiss. des Indes, pl. xxxiv, f. 180; Home, Phil. Trans. and F. Cuv. Mammif. (The Dugong.) It inhabits the Indian Ocean, and is frequently confounded by travellers with the Manatus.

Stellerus, Cuv.—Rytina, Illig.(3)

The Stelleri appear to have but a single compound grinder on each side, with a flat crown, and bristled with plates of enamel. Their fins have not even the little nails observed on those of the Manatus. According to Steller, the first, and hitherto the only one who has described them, their stomach also is much more simple.

One species only is known, which is confined to the north part of the Pacific Ocean.(4)

FAMILY II.

CETACEA ORDINARIA.

The Ordinary Cetacea are distinguished from the preceding by the singular apparatus from which they have received the

(1) See Oss. Foss. tom. I.

(2) *Halicore*, Maid of the Sea.

(3) *Rytina*, wrinkled.

(4) Nov. Comm. Petrop. II, 294, et seq. It has never been figured.

name of *Blowers*. As a large quantity of water passes into their huge mouths along with their prey, some way was necessary by which they could get rid of it; accordingly, it passes through the nostrils by means of a peculiar disposition of the velum palati, and is accumulated in a sac situated at the external orifice of the cavity of the nose, whence, by the compression of powerful muscles, it is violently expelled through a narrow opening on the top of the head. It is in this way they produce those jets d'eau observed by navigators at so great a distance. Their nostrils, continually bathed in salt water, could not be lined with a membrane sufficiently delicate to enable them to detect odours, and accordingly, they have none of those projecting laminæ found in the nasal cavities of other animals; the olfactory nerve is deficient in several, and if there be any which enjoy the sense of smell, it must be in a very slight degree. Their larynx, of a pyramidal form, penetrates into the posterior nares to receive air and conduct it to the lungs, without compelling the animal to raise its head and throat above the water for that purpose: there are no salient laminæ in the glottis, and the voice is reduced to a simple lowing. They have no vestige of hairs, but their whole body is covered with a smooth skin, under which is that thick layer of blubber abounding in oil, the principal object for which they are pursued. Their mammæ are near the anus, and their fins are incapable of grasping.

The stomach is divided into five and sometimes into seven distinct sacs; instead of one single spleen, they have several, small and globular; those which are possessed of teeth, have them all conical and alike; they do not chew their food, but swallow it rapidly.

Two small bones suspended in the flesh, near the anus, are the only vestiges of posterior extremities.

Several have a vertical fin on the back, composed of a tendinous substance, but unsupported by bone. Their eyes, flattened in front, have a thick and solid sclerotica; the teguments of the tongue are soft and smooth.

They may be again divided into two small tribes: those in

which the head bears the usual proportion to the body, and those in which it is immoderately large. The first comprehends the Dolphins and the Narwhals.

Delphinus, Lin.

The Dolphins have teeth in both jaws, all simple, and almost always conical. They are the most carnivorous, and, in proportion to their size, the most cruel of their order. There is no cæcum.(1)

Delphinus, Cuv.

The Dolphins, properly so called, have a convex forehead, and the muzzle forming a kind of rostrum, or snout, in front of the head, more slender than the rest.

D. delphis, L.; Lacep. Cet. pl. xiii, f. 1. (The Common Dolphin.) The snout depressed and armed on each side of the jaw with from forty-two to forty-seven teeth, slender, arcuate, and pointed; black above, white beneath; from eight to ten feet in length. This animal, found in numerous bodies in every sea, and celebrated for the velocity of its motion, which sometimes precipitates it on the decks of vessels, appears really to have been the Dolphin of the ancients. The entire organization of the brain seems to indicate the docility they attributed to it.

D. tursio, Bonnaterre; vulg. *le Souffleur;* Lacep. XV, f. 2. (The Great Dolphin.) Snout short, broad and depressed; from twenty-one to twenty-four teeth throughout, conical, and often blunted. Individuals have been seen fifteen feet in length, and it appears that they are found in the Mediterranean as well as in the Ocean.(2)

D. dubius, Cuv. Only thirty-six or thirty-seven teeth throughout, but as fine and pointed as those of the Common Dolphin, which it also resembles in its colours.

D. frontalis, Duss. Very similar to the preceding, but coloured somewhat differently, and has thirty-four teeth throughout. Discovered by M. Dussumier, at the Cape de Verd Islands.

D. frontatus, Cuv. But twenty-one teeth throughout, larger

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(1) There is no family of the Mammalia more difficult to observe, of which we have more imperfect descriptions, and whose synonymes are more fluctuating than that of the Cetacea. I have endeavored to select authentic species.

(2) The *Whale* or *Capidolio* of Belon, and the *Orca*, of the same author, which very probably is that of the ancients, belong also to the division of Dolphins with snouts, and are much larger than the above mentioned species; but their characters are not sufficiently determined. The *Dauphin fèrce* of Bonnaterre is probably referable to one of the two.

than those of the preceding; the muzzle is also longer and more compressed; its origin is not known.

D. plumbeus, Dussum. The muzzle with the same compressed form, but armed throughout with thirty-seven teeth. From Malabar.(1)

D. velox, Dussum. A somewhat longer muzzle, and forty-one teeth throughout. From Ceylon.

D. longirostris, Dussum. Surpasses even the Common Dolphin in the number of its teeth, having from fifty-five to sixty throughout. From the coast of Malabar.(2)

M. de Blainville separates from this first division of Dolphins, under the name of DELPHINORHYNCHUS, those species in which the snout, though long and slender, is not separated from the forehead by a decided furrow. One of them,

D. micropterus, Cuv., was thrown upon the coast of France; it is remarkable for its dorsal fin, which is also placed very far back. It grows to the length of fifteen feet, and loses all its teeth at an early age.(3)

D. rostratus, Cuv. A slender muzzle, and externally all of a piece with the head; twenty-one teeth throughout. Its dorsal fin is of the usual size.(4)

D. gangeticus, Roxburg, (The Dolphin of the Ganges) should be distinguished from this first group. Its spiracle is longitudinal, and the jaws slender and inflated at the end. It ascends the Ganges to a great distance, and is probably the *Platanista* of Pliny.

PHOCÆNA, Cuv.

The Porpoises(5) have no rostrum, but a short, and uniformly convex muzzle.

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(1) I suspect this *D. plumbeus* to be the same as the *D. malaianus* of MM. Lesson and Garnier, Voy. de la Coq. pl. ix, f. 5.

(2) We cannot, in this work, give a place to species which have been only seen at a distance, and of which no part has been produced; we therefore mention, merely as indications, the *D. albigena*, Quoy and Gaym., Voy. de Freyc. pl. xi, or *D. superciliosus*, Lesson and Garn., Voy. de la Coq. pl. ix, f. 2.—The *D. cruciger*, Quoy and Gaym. Ib. f. 3 and 4, which is at least closely allied to the *D. bivittatus*, Less. and Garn. f. 3.—The *D. lunatus*, Less. and Garn. f. 4.—Still less can we admit species which have not even been figured.

(3) Blainville, Nouv. Bullet. des Sc. IV, p. 139, and Fr. Cuv. Mammif. under the very improper name of *D. de Dale*, which belongs to the *Hyperoodon*.

N.B. The *D. rostratus* of Shaw is the *gangeticus*.

(4) Add the *Dauphin couronné*, Freminville, Nouv. Bullet. des Sc. III, No. 56, pl. 1, f. 2.

(5) Porpoise, from *porcus piscis*, hog-fish.

D. phocæna, L.; Lacep. XIII, f. 2. (The Common Porpoise.) The teeth compressed, trenchant and rounded, from twenty-two to twenty-five on each side in each jaw; blackish above, white beneath. It is the smallest of the Cetacea, seldom exceeding four or five feet in length; very common in all our seas, where it is found in large troops.

D. capensis, Dussum. (The Cape Porpoise.) Similar to the preceding, but has twenty-eight teeth throughout, cylindrical, slightly pointed, and not compressed like those of the common species. From the Cape seas.

D. orca and *D. gladiator; Buts-kopf* and *Schwerd-fisch* of the Hollanders and Germans; Lacep. XV, 1, and not so well, V, 3. (The Grampus.)(1) Teeth, thick, conical and slightly hooked, eleven every where; the posterior ones flattened transversely; the body black above, white underneath; a white spot on the eye in the form of a crescent; the dorsal fin elevated and pointed. It is the largest of the Dolphins, being frequently found from twenty to twenty-five feet in length, and is the most relentless enemy of the Whale. They attack it in troops and torment it until it opens its mouth, when they devour the tongue.

D. aries, Risso; Ann. Mus. XIX, pl. i, fig. 4. A smaller species sometimes seen upon the coast of France, which soon loses the upper teeth and preserves only a few of the lower ones. Its dorsal fin is lower and further back than that of the Grampus.(2)

D. globiceps, Cuv.(3) Ann. Mus. XIX, pl. i, fig. 2 and 3; *D. deductor*, Scoresby. (The Round-headed Grampus.) Top of the head so arched as to be globular; long, pointed, pectoral fins; it is more than twenty feet in length; black, with a white stripe from the throat to the anus. It lives in troops of several hundreds, led by the old males, and is sometimes thrown upon the coasts of Europe. It has from nine to thirteen teeth throughout, but loses them all with age.

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(1) Grampus, a corruption of *grand poisson*. *Buts kopf*, or rather *Boots kopf*, signifies that its head is made like a long-boat. *Schwerd fisch*, Sword-fish, from its dorsal fin.

(2) The *Epaulard ventru* of Bonnaterre, Lacep. XV, 3, copied from Hunter, Phil. Trans. presents a similar form; but Hunter's specimen was eighteen feet long, and ours never exeeeds ten.

The *D. griseus*, Ann. Mus., XIX, pl. i, f. 1, is merely a bad drawing of this *D. arics*, Ib. f. 4. The true *aries* of the ancients is the Grampus.

(3) It is the head of the *D. globiceps* deprived of its teeth, which is engraved in Bonnaterre, Cetol. pl. vi, f. 2: and in Lacep. pl. ix, f. 2, under the name of *Cachalot swinewal;* and in Camper, Cet. pl. xxxii, xxxiii and xxxiv, under that of the *Toothless Narwhal.*

Delphinapterus, Lacep.

Only differs from the Porpoises in having no dorsal fin.

D. leucas, Gm.; *D. albicans*, Fabr.; *Huïd fisk* of the Danes; Scoresby, Arct. Reg. II, pl. xiv. (The Beluga.) Nine teeth throughout, thick and blunt at the end; skin of a yellowish white; head, externally convex, like that of a Porpoise; as large as the Grampus. Found in the Frozen Ocean, whence it often ascends rivers to some distance.(1)

D. leucoramphus, Peron.; Voy. de la Coq. pl. ix.(2) Inhabits the South seas; the head is convex and pointed; the muzzle, a part of the pectoral fins, and the whole under part of the body of a beautiful white. The back is blue, and it has from thirty-eight to forty-two teeth throughout. The

D. phocænoides is a species of this subgenus, discovered by M. Dussumier at the Cape; it has the round head, and the compressed and obtuse teeth of the Porpoise.(3)

Hyperoodon, Lacep.(4)

The body and muzzle very similar externally to those of the Dolphin properly so called; but the cranium is elevated at its edges by vertical bony partitions; they are generally found to have but two small teeth in front of the lower jaw, which do not always appear externally; their palate is studded with small tubercles.

One species only is known, which attains a length of from twenty to twenty-five feet, and perhaps more. It is taken in the British Channel and the North Sea, and is often called the *Baleine à bec.*(5)

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(1) Rondelet, under the name of *peis-mular* and of *senedette*, represents a Cetaceous animal very similar to the Beluga; but he does not say it is white. He also applies to it the Italian name of *capidolio*. It would be one Delphinapterus more, if the figure were not ideal; but I fear such is the case, and the more so as this name of *mular* and that of *capidolio* belong properly to the Cachalot. Besides this, the Beluga has occasioned the formation of a little white Cachalot, from the circumstance of so soon losing its upper teeth. See its head, Voy. de Pallas, Atl. pl. lxxix.

(2) The muzzle in this figure is too pointed. The *White Dolphin* with black extremities of Commerson must be nearly allied to it.

(3) M. Rafinesque speaks of a Dolphin with two dorsal fins, and MM. Quoy and Gaymard saw one they have named *D. rhinoceros*, Voy. de Freycinet, II, f. 1; but they saw it at a distance, and half merged in the waves, so that there may have been some optical illusion.

(4) *Hyperoodon*, teeth in the palate.

(5) This animal, described by Baussard, Jour. de Phys. March 1789, (*Delph. edentulus*, Schr.) to which Bonnaterre has transferred the name of *buts-kopf*, which

Monodon, Lin.

The Narwhals have no teeth properly speaking, but mere long, straight and pointed tusks, implanted in the intermaxillary bone, and directed in the line of the axis of the body. The form of their body and that of their head greatly resemble that of the Porpoises. One species only is well known, the

M. monoceros, L.; Scoresby, Arct. Reg. pl. xv.(1) The Narwhal.) The tusk of this animal, which is spirally furrowed and sometimes ten feet in length, was for a long time called the horn of the Unicorn. It has, it is true, the germs of two tusks, but it is very seldom that both become equally developed. That of the left side usually attains its full growth, while the other always remains hidden in its alveolus.(2) According to the description of the Narwhal, it is hardly more than twice or thrice the length of its tusk; the skin is marbled with brown and a kind of white; the muzzle is arched; mouth small; spiracle on top of the head, and no dorsal fin, but merely a salient crest along the spine. The tusks are sometimes found perfectly smooth.(3)

The other Cetacea have the head so large as to constitute one third or one half of the length of the whole body; but neither the cranium nor the brain participate in this dispro-

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belongs to the Grampus, is the same as the *Two-toothed Dolphin* of Hunter; Baussard expressly mentions its two teeth. It is also the *Balæna rostrata* of Klein and of Chemnitz, Besch. der Berl. ges. IV, p. 183; of Pennant, Brit. Zool. No. V; of Pontoppidan, Ncr. II, 120; the *Bottle-head* of Dale, &c. Chemnitz found one of the teeth. See Oss. Foss. tom. V, p. 1, f. 324.

(1) The *Narval microcephale*, Lacep. pl. v, f. 2, is nothing more than a common Narwhal, not quite so badly figured as in pl. iv, f. 3, which is copied from a bad drawing of Klein, Pisc. per Pulm. Resp. pl. ii, fig. c, from an individual captured in the Elbe in 1736, afterwards stuffed and exhibited in Dresden. Anderson gives a rather better figure of the same individual. Fr. Tr. II, p. 108.

(2) We have found this small tusk in several crania, and verified the statements of Anderson on this subject. It is prevented from being developed by its internal cavity becoming too rapidly filled with the matter of the ivory, which thus obliterates its gelatinous core.

(3) The *Monodon spurius* of Fabricius, or *Anærkak* of Greenland, (*Ancylodon*, Illig.) which has but two small curved teeth in the upper jaw and a dorsal fin, cannot be far removed from the Hyperoodon. *Val*, *wale*, in all the languages derived from the Teutonic, signifies Whale, and is often employed for the Cetacea in general; *nar*, in the language of the Icelanders, means *cadaver*, or dead body, and it is pretended that such is the food of this genus.

portion, which is altogether owing to an enormous development of the bones of the face.

PHYSETER, Lin.

The Cachalots(1) are Cetacea with a very voluminous head, excessively enlarged, particularly in front, in whose upper jaw there is neither whalebone nor tooth, or if any, very small, and not projecting; the lower jaw, narrow, elongated, and corresponding to a furrow in the upper one, is armed on each side with a range of cylindrical or conical teeth, which, when the mouth is closed, enter into corresponding cavities in the upper jaw. The superior portion of their enormous head consists almost entirely of large cavities, separated and covered by cartilages, and filled with an oil which becomes fixed as it cools, well known in commerce by the name of *spermaceti*, a substance for which they are principally sought; the body not having much fat, and consequently yielding but little oil. These cavities, however, are very distinct from the true cranium, which is rather small, is placed under their posterior portion, and contains the brain as usual. It appears that canals, filled with this spermaceti, or adipocire as it is called, are distributed to several parts of the body, communicating with the cavities which fill the mass of the head; they even ramify through the fat or blubber that is found beneath the skin.

The odorous substance, named *ambergris*, appears to be a concretion formed in the intestines of the Cachalot, particularly during certain states of disease, and it is said, chiefly in the cæcum.

The species of the Cachalots are far from being well ascertained. That which appears to be the most common, the *macrocephalus* of Shaw and Bonnaterre, (Lacep. X)(2) in lieu of a dorsal fin, has a mere callous prominence. There are from twenty to twenty-three teeth on each side of the lower jaw, and some small conical ones hidden beneath the gum in the upper one. Its spiracle is single, and not double as in the greater part of the other Cetacea ; neither is it symmetrical, but is directed towards the left, and terminates on that side, on the front of the muzzle, which is truncated.(3) In addition to this, it is said that the left eye is much smaller than the other, and that

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(1) *Physeter* as well as *physalus*, signifies *blower*. *Cachalot* is the name used by the Biscayans ; from *cachau*, which in the Cantabrian dialect means *tooth*.

(2) It is not the *macrocephalus* of Linnæus.

(3) We have verified on two crania this want of symmetry in the spiracle, announced by Dudley, by Anderson and by Swediauer, which inclines us to credit the inequality of the eyes mentioned by Egede.

the whalers always endeavour to attack the animal from that quarter. If this species alone furnishes, as is asserted, all the spermaceti and ambergris of commerce, it must be very widely diffused, for these articles are drawn from the North and the South. Cachalots, without dorsal fins, have been taken even in the Adriatic.(1) The

Physeter, Lacep.

Is a Cachalot with a dorsal fin. Two species only are distinguished among them, *microps*, and *tursio* or *mular*, and those, from the very equivocal character of teeth, arcuated or straight, sharp or blunt.(2)

They are found in the Mediterranean as well as in the Arctic Ocean. Those of the latter are said to be the most inveterate enemies of the Seals.

Balæna, Lin.

The Whales are equal in size to the Cachalots, and in the proportional magnitude of the head, although the latter is not so much enlarged in front; but they have no teeth. The two sides of their upper jaw, which is keel-shaped, are furnished with thin, compact,

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(1) We perceive no real difference between this Cachalot, of which we have good figures and several parts of the skeleton, and that of Roberson, Phil. Trans., Vol. LX, of which Bonnaterre has made a species under the name of *trumpo*, which is applied, at Bermuda, to a Cachalot, without any more precise indication.

As to the Little Cachalot, *P. catodon*, Lin., no other difference is mentioned besides that of size, than that the teeth are sharper, a circumstance that may depend upon age. It is not even certain that those which have been produced are not those of some large Dolphin.

The *Physeter macrocephalus* of Linnæus, *Cach. cylindrique* of Bonnaterre, (genus Physalus of Lacep.) would have a good character in the distant location of its spiracle; but this species merely rests on a bad figure of Anderson, and no one has ever seen any thing like it.

The *albicans* of Brisson, *huid-fisk* of Egede and Anderson, converted by Gmelin into a variety of the *macrocephalus*, is the *beluga dolphin*, which sheds its teeth at a very early age, a fact we have ascertained.

(2) The only one tolerably well ascertained, is from a bad figure of *Bayer*, Act. Nat. Cur. III, pl. 1, taken from an animal thrown on shore at Nice. The name *mular* has been very vaguely applied to it; the *mular* of Nieremberg is a Cachalot, it is true ; but there is nothing to prove it is one species more than another.

As to the different indications of the Cachalots of authors, see my Oss. Foss. tom. V, p. 328, et seq. Add to them the figure given in the Journ. des Voyages, of February 1826, and that in the Voy. de Freycinet, pl. xii. With respect to the Cachalots described by M. de Lacepede, Mem. du Museum, tom. IV, from Japanese drawings, the very nature of the document on which they rest forbids me from giving them a place here.

transverse laminæ, called whalebone, formed of a kind of fibrous horn, fringed at the edges, which serve to retain the little animals on which these enormous Cetacea feed. Their lower jaw, supported by two osseous branches arched externally and towards the summit, and completely unarmed, lodges a very thick and fleshy tongue, and when the mouth is closed, envelopes the internal part of the upper jaw, and the whalebone with which it is invested. These organs do not allow whales to feed on such large animals as their size might induce us to imagine. They live on fish, but principally on Worms, Mollusca, and Zoophytes, selecting, it is said, the very smallest, which become entangled in the filaments of the whalebone. Their nostrils, better organised for the sense of smell than those of the Dolphins, are furnished with some ethmoidal plates, and appear to receive some small filaments from the olfactory nerve. Their cæcum is short.

Bal. mysticetus,(1) L.; Lacep. Cet. pl. 2 and 3, under the name of *Nord-Caper*, and Scoresby, Arct. Reg. II, pl. 12. (The Common Whale.)(2) It has long been considered the largest of all animals; but from the late observations of captain Scoresby, it appears that it scarcely ever exceeds seventy feet, a length frequently surpassed by the wrinkle-bellied whales. It has no dorsal fin. To procure its fat or blubber, which is sometimes several feet in thickness, and contains immense quantities of oil, whole fleets are annually equipped. Formerly sufficiently bold to venture into our seas, it has gradually retired to the extreme North, where the number is daily diminishing. Besides oil, it produces black and flexible whalebone, eight or ten feet in length, each individual having from eight to nine hundred strips on each side of the palate. One hundred and twenty tuns of oil are obtained from a single whale. Shell-fish attach themselves to its skin, and multiply there as on a rock, and some of the Balanus family even penetrate into it. It is asserted that these

(1) The φαλαινα of Aristotle and Ælian, which was an enemy of the Dolphin, appears to have been a large cetaceous animal armed with teeth; the only true Whale known to Aristotle was his *mysticetus*, which had, says he, setæ in the mouth in place of teeth; most probably the Whale, with the wrinkled throat, of the Mediterranean. It is thought, however, that Juvenal alludes to the common Whale in the following line,

"Quanto delphinis balæna britannica major;"

but the Latins applied the term Balæna, in a general way, to all the great Cetacea, just as the people of the North do that of Whale, or Wall, and its derivatives, a remark essentially requisite to those who study their writings.

(2) The old figure of Martens, recopied Lacep. I, pl. 1, and in all other authors, represents the head too long.

enormous animals feed exclusively on very small Mollusca, which abound, it is true, in the seas they inhabit. Their excrement is of a beautiful red colour, and affords a tolerable die.(1)

Other species (Balænoptera, Lacep.) have a dorsal fin: they are also again subdivided into such as have a smooth belly, and those in which it is wrinkled. The

Balænoptera, *with a smooth belly*,

Are closely allied to the Whales proper. One only is cited, the

Balæna physalus, *Finnfisch* of the Hollanders; copied from Martens by Anderson, Bonnaterre, and others; Lacep. I, fig. ii. (The Gibbar.) As long as the Common Whale, but more slender; very common in the same latitudes, but shunned by the fishermen on account of its extreme ferocity, and the paucity of its oil; to capture it is a difficult, and for small vessels a dangerous undertaking, on account of the violence of its motions when attacked. It is far from certain that it is not a *Jubarta*, whose name has been corrupted. The

Balænoptera, *with a wrinkled belly*, *or* Rorquals,(2)

Have the skin of the underpart of the throat and chest folded longitudinally into plicæ, forming very deep wrinkles, and consequently susceptible of great dilatation, the use of which is unknown. It appears that the seas of Europe contain two species.

Bal boops, L.; *Jubarte* of the Biscayans; Lacep. I, f. 3,—IV, f. 1 and 2,—V, f. 1, and VIII, 1 and 2. (The Jubarta.) Superior in length to the Common Whale, but has all the dangerous propensities of the Gibbar.

Bal. musculus, Lin.; Lacep. pl. vi and vii. (The Rorqual of the Mediterranean.) Which only differs from the Jubarta in some of the details of its proportions.(2)

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(1) It is from an erroneous interpretation of certain passages of Martens and Zorgdrager, that naturalists have made a peculiar species of the *Nord-Caper*, which should be a northern whale more slender than the common one; but in the Antarctic Seas there is a species very similar to the Common Whale, which the Hollanders of the Cape also call *Nord-Caper*. See Oss. Foss. p. 361, 363.

(2) *Rorqual*, whale with tubes, from its plicæ.

(3) The *Balæna rostrata* of Hunter, of Fabricius and of Bonnaterre, or the *Boops*, is very different from that of Pennant and of Pontoppidan, which is the Hyperoodon.

The *Balæna gibbosa* and the *gibbosa* B. or *nodosa* of Bonnaterre, should be better determined; but they are only known through Dudley, Phil. Trans. 387, and we are not sure they were precisely in their natural state. See Oss. Foss. loc. cit.

OF THE OVIPAROUS VERTEBRATA.

Although the three classes of the Oviparous Vertebrata differ greatly from each other in their quantum of respiration, and in all that relates to it, viz. the power of motion and the energy of the senses, they present several common characters when opposed to the Mammalia, or Viviparous Vertebrata.

The hemispheres of their brain are very slender, and are not united by a corpus callosum; the crura of the cerebellum do not form that protuberance called the *pons Varolii;* the nates—at least in two of these classes—become greatly developed, contain a ventricle, and are not covered by the hemispheres, but are visible below, or on the sides of the cerebrum; their nostrils are less complex; the ear has not so many small bones, which in several are totally wanting; the cochlea, when it exists, which is only the case in Birds, is much more simple, &c. Their lower jaw, always composed of numerous pieces, is attached by a concave facet to a salient process, which belongs to the temporal bone, but separated from its petrous portion; the bones of their cranium are more subdivided, although they occupy the same relative places, and fulfil similar functions; thus the os frontis is composed of five or six pieces, &c. The orbits are merely separated by an osseous lamina of the sphenoidal bone, or by a membrane. When these animals have anterior extremities, besides the clavicle, which is frequently united to its fellow on the opposite side, and is then called fourchette, the scapula also rests upon the sternum, by a very broad and long coracoid apophysis. The larynx is more simple, and has no epiglottis; the lungs are not separated from the abdomen by a perfect diaphragm, &c. To render all these affinities sensible, however, it would be necessary to enter into anatomical details, which

do not belong to this first part of our work. It is sufficient that we have here pointed out the mutual analogy of the Ovipara, which, as regards the plan on which they are constructed, is greater than that of any one of them with the Mammalia.

Oviparous generation consists, essentially, in this—the young animal is not attached by a placenta to the parietes of the uterus, or of the oviduct, but remains separated from it by its most external envelope. Its aliment is prepared before hand, and enclosed in a sac attached to its intestinal canal; this is what is called the vitellus, or yolk of egg, of which the young animal is a sort of appendage, at first imperceptible, which is nourished and augmented by absorbing the fluid of that yolk. Such of the Ovipara as breathe with lungs have the egg furnished with a highly vascular membrane, which appears to serve for the purposes of respiration; it is connected with the bladder, and is analogous to the allantoid of the Mammalia. It is neither found in Fishes nor in the Batrachians, which latter, when young, respire, like Fishes, by branchiæ.

Many of the cold-blooded Ovipara do not bring forth their young until they are developed and extricated from their shell, or other membranes, which separated them from the mother. These are called *false Ovipara.*

CLASS II.

AVES.

Birds are Oviparous Vertebrata, with double systems of circulation and respiration, organized for flight.

Their lungs, undivided and attached to the ribs, are enveloped by a membrane pierced with large holes, which allow the air to pass into several cavities of the chest, lower part of the abdomen, arm-pits, and even of the interior of the bones, so that not only is the surface of the pulmonary vessels bathed in the ambient fluid, but that also of an infinitude of vessels in other parts of the body. Thus, in certain respects, Birds respire by the branches of the aorta, as well as by those of the pulmonary artery, and the energy of their irritability is in proportion to their quantum of respiration.(1) The whole body is so constructed as to profit by this energy.

Their anterior extremities, destined to sustain them in flight, could neither serve them for standing, nor for prehension; they are bipeds then, and pick up objects from the earth with their mouth; their body, consequently, is inclined before their legs, the thighs directed forwards, and the toes elongated, to form a sufficient base for it. The pelvis is very much extended in length, in order to furnish points of attachment to those muscles which support the trunk upon the thighs. There is even a suite of muscles reaching from the pelvis to the toes, passing over the knee and heel, so that the simple weight of the bird flexes the toes; it is thus that they

(1) Two common Swallows consume as much pure air as a Guinea-Pig. Lavoisier, Mem. de Chimie, I, 119.

are enabled to sleep in security, while perched on one foot. The ischia, and particularly the ossa pubis are lengthened out behind, and the interval between them is widened, in order to allow the necessary space for the development of the ovum.

The neck and the beak are elongated to reach the ground, but the former has the requisite flexibility for bending backwards when at rest,—consequently, it has many vertebræ. The trunk, on the contrary, which serves as a point d'appui to the wings, has but little mobility; the sternum, particularly, to which are attached the muscles which lower the wings in flight, is of great extent, and has its surface still more enlarged by a salient process in its middle. It is originally composed of five pieces: a middle one, of which this salient lamina makes a part; two triangular, anterior, lateral ones, for the articulations of the ribs, and two posterior, which are lateral and bifurcated, to increase its surface. The greater or less degree of the ossification of the notches of these last, and the extent of the interval they leave between them and the principal bone, denote a relative strength of wing and power of flight. The diurnal Birds of prey, the Swallows and the Humming-birds, lose, as they grow old, all traces of these unossified spaces.

The *fourchette* produced by the junction of the two clavicles, and the two powerful stretchers formed by the coracoid apophyses, keep the shoulders apart, notwithstanding the efforts requisite for flight, that act in an opposite direction; the greater the power of flight, the more open and strong is the fourchette. The wing, supported by the humerus, fore-arm and hand, the latter of which is elongated, and has one finger and vestiges of two others, is furnished throughout its length with a range of elastic quills, which greatly extends the surface that resists the air. Those which belong to the hand are termed *primaries*, and there are always ten; those attached to the fore-arm are called *secondaries*, but their number varies; weaker feathers appended to the humerus are called *scapulars*; the bone, which is analogous to the thumb, is also furnished

with what are termed *bastard quills*. Along the base of the quills is a range of feathers named *coverts*.

The bony tail is very short, but has a range of large quills, which, when spread out, assist in supporting the bird; they are generally twelve in number, sometimes fourteen, and in the Gallinaceæ eighteen.

The legs have a femur, a tibia and a fibula, which are connected with the femur by an articulation with a spring, which keeps up the extension without any effort on the part of the muscles. The tarsus and metatarsus are represented by one single bone, terminating below in three pullies.

Most commonly there are three toes before, and a thumb behind; the latter being sometimes deficient. In the Martins it is directed forwards. In the Climbers, on the contrary, the external toe and the thumb are directed backwards. The number of articulations increases in each toe, commencing with the thumb, which has two, and ending with the external toe, which has five.

Birds are generally covered with feathers, a kind of tegument best adapted for defending them from the rapid variations of temperature to which their movements expose them. The air cavities which occupy the interior of their body, and even supersede the marrow in the bones, increase their specific lightness. The sternal, as well as the vertebral portion of the ribs is ossified, in order to give more power to the dilatation of the chest. To each rib is annexed a small bone, which soon becomes soldered to it, and is directed obliquely towards the next one, thereby giving additional solidity to the thorax.

The eye is so constructed, in Birds, as to distinguish, with equal facility, objects at a distance, or in its immediate vicinity; a vascular and plaited membrane, which stretches from the bottom of the globe to the edge of the crystalline, probably assists in effecting this, by displacing that lens. The anterior surface of the ball is also strengthened by a circle of bony pieces, and besides the two ordinary eye-lids, there is always a third one placed at the internal angle, which, by a remark-

able muscular apparatus, can be drawn over the eye like a curtain. The cornea is very convex, but the crystalline is flat, and the vitreous humour small.

The ear has but a single small bone, formed of one branch that adheres to the tympanum, and of another terminating in a plate that rests upon the fenestra ovalis; the cochlea is a slightly arcuated cone; but the semi-circular canals are large, and lodged in a part of the cranium where they are completely surrounded by air cavities, which communicate with the arca. Nocturnal Birds alone have a long external conch, which, however, does not project like that of Quadrupeds. The external meatus is generally covered with feathers, whose barbs are more fringed than the others.

The organ of smell, concealed in the base of the beak, usually has but three cartilaginous ossa turbinata, which vary in complication; although there are no sinuses within the parietes of the cranium, it is extremely sensible. The breadth of the osseous openings of the nostrils determines the strength of the beak; and the cartilages, membranes, feathers and other teguments which narrow down those apertures, influence the power of smell, and the nature of the food.

There is but little muscular substance in the tongue, which is supported by a bone articulated with the hyoid; in most Birds this organ is not very delicate.

The feathers, as well as the quills, which only differ in size, are composed of a stem, hollow at base, and of barbs, which are themselves furnished with smaller ones; their tissue, lustre, strength, and general form vary infinitely. The touch must be feeble in all such parts as are covered with them, and as the beak is almost always corneous, and has but little sensibility, and the toes are invested with scales above, and a callous skin underneath, that sense can have but little activity in this class of animals.

Birds moult twice a year. In certain species, the winter plumage differs in its colours from that of summer; in the greater number, the female differs from the male in an inferior vividness of tints, and when this is the case, the young of

both sexes resemble the former. When the adult male and female are of the same colour, the young ones have a livery peculiar to them.

The brain of Birds has the same general characters as that of other Oviparous Vertebrata, but is distinguished by its very great proportionate size, which often surpasses even that of this organ in the Mammalia. This volume principally depends upon tubercles, analogous to the corpora striata, and not upon the hemispheres, which are narrow and without circumvolutions. The cerebellum is tolerably large, and almost without lateral lobes, being chiefly constituted by the vermiform process.

The rings of the trachea are entire; there is a glottis at its bifurcation most commonly furnished with peculiar muscles, which is called the *inferior larynx;* this is the spot where the voice of birds is produced; the immense volume of air contained in the air sacs contributes to its strength, and the trachea, by its various forms and motions, to its modifications. The superior larynx, which is extremely simple, has but little to do with it.

The face, or upper mandible of Birds, consisting chiefly of their intermaxillaries, is lengthened out behind into two arches, the internal of which is composed of the pterygoid and palatine bones, and the external of the maxillaries and jugals, both of which rest on a movable *tympanic* bone, commonly called the *square bone,* analogous to that of the drum of the ear; above, this same face is articulated with the cranium, or united to it by elastic laminæ, a kind of union which always allows the parts some degree of motion.

The horny substance which invests the two mandibles, performs the office of teeth, and is sometimes so jagged as to resemble them; its form, as well as that of the mandibles which support it, varies extremely, and according to the kind of food used by each species.

The digestion of Birds is in proportion to the activity of their life, and the force of their respiration. The stomach is composed of three parts: the crop, which is an enlargement of

the esophagus; a membranous stomach, in the thickness of whose parietes are a multitude of glands whose juices humect the aliment; and finally, the gizzard, armed with two powerful muscles, united by two radiated tendons, and lined internally with a cartilaginous kind of velvet. The food is the more easily ground there, as birds constantly swallow small stones, in order to increase its triturative power.

In the greater part of the species which feed exclusively on flesh or fish, the muscles and villous coat of the gizzard are greatly attenuated; and it seems to make but a single sac with the membranous stomach.

The dilatation of the crop is also sometimes wanting.

The liver pours its bile into the intestine by two ducts, which alternate with the two or three through which the pancreatic fluid passes. The pancreas of Birds is large, but their spleen is small; the epiploon is wanting; its functions, however, are partly fulfilled by the partitions of the air cavities; two blind appendages are situated near the origin of the rectum, and at a short distance from the anus; they are longer or shorter, according to the regimen of the genus. In the Herons it is short; in other genera, that of the Woodpeckers for instance, it is totally deficient.

The cloaca is a pouch, in which the rectum, ureters, spermatic ducts, and in the female, the oviduct, terminate; it opens externally, by the anus. Strictly speaking, Birds do not urinate, as that excretion mingles with their solid excrement. In the Ostriches alone, is the cloaca sufficiently dilated to allow of an accumulation of the urine.

In most genera, coition is effected by the simple juxtaposition of the anus; the Ostriches, and several of the Palmipedes, however, have a penis furrowed with a groove, through which the semen passes. The testes are situated internally, and near the lungs; only one oviduct is developed; the other is reduced to a small sac.

The egg, detached from the ovary, where it consists merely of yolk, imbibes that external fluid, called the white, in the upper part of the oviduct, and becomes invested with its shell at the bottom of the same canal. The chick contained within

it is developed by incubation, unless the heat of the climate suffices for that purpose, as is the case with the egg of the Ostrich. The young Bird has a little horny point at the extremity of the beak, with which it splits open the shell, and which falls off a few days after it is hatched.

The industry and skill exhibited by Birds in their variously constructed nests, and their tenderness and care in protecting their eggs and young, are known to every one; it is the principal part of their instinct. Their rapid transitions through different regions of the air, and the vivid and continual action of that element upon them, enable them to anticipate atmospheric changes, to an extent of which we can form no idea, and caused the ancients, in their superstition, to attribute to them the power of prescience or divination. It is unquestionably on this faculty, that depends the instinct which acts upon the Birds of passage, prompting them to seek the south on the approach of winter, and the north on the return of spring. They have memory, and even imagination—for they dream. They are easily tamed, may be taught to render various services, and retain the air and words of songs.

Division of the Class of Birds into Orders.

Of all classes of animals, that of Birds is the most strongly characterized, that in which the species have the greatest mutual resemblance, and which is separated from all others by the greatest interval; circumstances which, at the same time, render its subdivision the more difficult.

Their distribution is founded, like that of the Mammalia, on the organs of manducation or the beak, and on those of prehension, that is, on the beak, and particularly on the feet.

The first that arrest our attention are the *palmated feet*, or those in which the toes are connected by membranes, which distinguish all *Swimming Birds*. The position of these feet behind; the length of the sternum; the neck, often longer than the legs to enable it to reach below; the dense, polished

plumage, impermeable to water, all concur with the feet in making good navigators of the Palmipedes.

In other birds, which most commonly are partially web-footed, at least between the external toes, we observe elevated tarsi; legs divested of feathers at their lower extremities; a long, thin shape, and in fine, all the requisites for wading along the shores of rivers to seek their food. Such, in fact, is the regimen of the greater number; and although some of them inhabit dry grounds, they are called, *Shore-Birds*, or *Waders*.

Among the true land birds, the *Gallinaceæ*, like our domestic Cock, have a heavy carriage, a moderate beak, the upper mandible of which is arched; the nostrils partly covered by a soft and inflated scale; the toes almost always indented on the edges, and short membranes between the bases of the anterior ones. They fly heavily, and but a short distance at a time. Their chief food is grain.

Birds of prey have a hooked beak, the point of which is sharp, and curved downwards; the nostrils pierced in a membrane which invests the whole base of that beak, and feet armed with vigorous talons. They live on flesh, pursue other birds, and are consequently, for the most part, vigorous in flight. The greater number have still a slight web between the external toes.

The *Passerinæ* comprise many more species than all the other families; but their organization presents so many analogies that they cannot be separated, although varying greatly in size and strength. Their two external toes are united at the base, and sometimes for a part of their length.

Finally, the name of *Scansoriæ*, or Climbers, has been given to those birds whose external toe, like the thumb, is directed backwards, because the greater number profit, by a conformation so favourable to a vertical position, to climb trees.(1)

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(1) From my first Tableau Elementaire, in 1798, I was obliged to suppress the Linnæan order of the Picæ, which has no one determined character. Illiger and the greater number of late naturalists have assented to this suppression.

Each of these orders is subdivided into families and genera, and principally from the conformation of the beak. But these different groups frequently pass into each other by almost imperceptible gradations, so that there is no other class in which the genera and sub-genera are so difficult to limit.

ORDER I.

ACCIPITRES, Lin.

Birds of prey are known by their hooked beak and talons, powerful weapons, with which they pursue other birds, and even the weaker quadrupeds and reptiles. They are among Birds what the Carnivora are among Quadrupeds. The muscles of their thighs and legs indicate the strength of their claws; their tarsi are rarely elongated; they have, all, four toes; the nail of the thumb and that of the internal toe are the strongest.

They form two families, the diurnal and the nocturnal.

The eyes of the diurnal Birds of prey are directed sideways; they have a membrane called the *cera*, covering the base of the beak, in which the nostrils are pierced; three toes before, one behind, without feathers, the two external ones almost always united at base by a short membrane; the plumage dense, the quills strong, and great power on the wing. Their stomach is nearly altogether membranous, their intestines of but small extent, their cæcum very short, their sternum broad and completely ossified in order to give more extended attachments to the muscles of the wings, and their fourchette semicircular and widely separated, the better to resist the violent flexions of the humerus necessary to a rapid flight.

Linnæus comprehended them all under two genera, which are so many natural divisions, the *Vultures* and the *Falcons*.

Vultur, Lin.

The Vultures have eyes even with the head, and reticulated tarsi, that is, covered with small scales; an elongated beak, curved only at the end, and a greater or less portion of the head, or even of the neck, divested of feathers. The strength of their talons does not correspond with their size, and they make more use of their beak than of their claws. Their wings are so long, that in walking they keep them in a state of semi-extension. They are a cowardly genus, feeding oftener on carrion than on a living prey; when they have fed, their crop forms a great protuberance above the fourchette, a fetid humour flows from their nostrils, and they are almost reduced to a state of stupid insensibility.

Vultur, Cuv.

The Vultures, properly so called, have a large and strong beak, the nostrils pierced transversely at its base; the head and neck without feathers or caruncles, and a collar of long feathers, or of down, at the root of the neck. They have hitherto been found only in the eastern continent.

V. fulvus, Gmel.; *V. trencalos*, Bechstein; *Le Percnoptere*, Buff. Enl. 326, and *Le Grand Vautour*, Id. Hist. des Ois. I, in 4to, pl. V;(1) *The Vulture*, Albinus, III, i; Nauman, pl. 2. (The Fulvous Vulture.) Grey, or of a brown verging upon fulvous; the down on the head and neck, cinereous; collar white, sometimes mixed with brown; quills of the wing and tail, brown; beak and feet lead coloured; belly of the adult white. It is the most universally diffused species, and is found on the mountains of the whole of the eastern continent. Its body surpasses in size that of the swan.(2)

V. cinereus, Gmel. Col. 425; Nauman, pl. v; Viellot, Gall. pl. i; *Arrian* of La Peyrouse; *Black Vulture*, *Cinereous Vulture*, &c. (The Brown Vulture.) A blackish brown; the collar mounting obliquely towards the occiput, which is furnished with a tuft of feathers; the feet and the membrane of the base of the beak of

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(1) The history of the Grand Vautour of Buffon belongs to the following species, but the figure is that of the *fulvus*.

(2) The *Vautour des Indes*, Lath. and Sonnerat, Tem. Pl. Col. 26, is at least a closely allied species, as well as the *Chassefiente*, Vaill. Affr. pl. 10. Add *V. ægypius* Tem. Col. 407.—*V. imperialis*, Ib. 426.

N.B. The *Fawn-coloured Vulture* is the genus Gyps of Savigny. The *Brown Vulture* is the type of his genus Ægypius.

a bluish violet. It is equally common with the preceding, and and is still larger, frequently attacking living animals.(1)

V. auricularis, Daud.; Vaill. Afr. pl. ix. (The Oricou.) Blackish; a longitudinal fleshy crest on each side of the neck, above the ear. From Africa.(2)

America produces Vultures remarkable for the caruncles which surmount the membrane of the base of their beak; the latter is as large as in the preceding species, but the nostrils are oval and longitudinal. They constitute the SARCORAMPHUS of Dumeril.(3)

Vult. papa, L.; Enl. 428; Viellot, Gal. 3; *Irubi Cha*, Azz. (The King of the Vultures.) As large as a goose; blackish when young, (Spix. pl. 1) then variegated with black and fawn colour, (Vaill. Afric. 13) and finally, in the fourth year, has a fawn coloured mantle, and black quills and collar. The naked parts of the head and neck are vividly tinged, and the caruncle is denticulated like the comb of a cock. It inhabits the plains and other hot parts of South America. Its name is derived from the circumstance of the *Urubus* retiring, through fear, when he stoops upon a body which they have already begun to devour.

Vult. gryphus, L.; Humb. Obs. Zool. pl. viii, and Tem. Pl. Col. 133 and 408. (The Condor.) Blackish; a great part of the wing ash coloured; collar silky and white; the male, in addition to his superior caruncle, which is large and entire, has another under the beak, like the cock. While young, it is of a cinereous brown, and without a collar. The caruncles are deficient in the female, which is of a brownish grey. This species has been rendered famous by exaggerated reports of its size; it is, however, but a little larger than the *Læmmer-geyer*, to which it assimilates in habits. It is found in the most elevated mountains of the Andes in South America, and flies higher than any other bird. The

CATHARTES, Cuv.—GALLINAZES, or CATHARISTES, Vieillot,

Have the beak of the Sarcoramphus, that is, large, and with oval and

(1) The *V. monachus*, Edw. 290; Vaill. 12 and Col. 13, only differs from the *Brown Vulture* in the beak, which is somewhat shorter. The *Crested Vulture* (*V. cristatus*, Gm.) is only known to me by a bad figure of Gesner, probably taken from some species of Eagle. The *V. barbarus* is the same as the *Læmmer-Geyer*, *Falco barbatus*.

(2) The Pondicherry Vulture, Sonnerat, pl. cv, or *V. ponticerianus*, Pl. Col. 2, is nearly allied to the Oricou. Its lateral crests do not ascend so high, and its beak is not so strong.

(3) M. Vieillot has changed this name into Zoppilota or Gypagus.

longitudinal nostrils, but no fleshy crest; their head and neck are without feathers.

V. californianus, Sh.; Tem. Col. 31. (The Vulture of California.) Approaches the Condor in size, but its wings are proportionably longer; the plumage is entirely brown.

V. aura, L., Enl. 187; Viellot, Am. Sept. 2 and Galer. 4. (The Turkey Buzzard.) Black; tail cuneiform; as large as a cock. *See App. XII of Am. Ed.*

Percnopterus,(1) Cuv.—Gypaetos, Bechstein.—Neophron, Savig.

The Percnopteri have a slender, long beak, slightly inflated above its curvature; the nostrils oval and longitudinal, and the head, but not the neck, divested of feathers. They are birds of a moderate size, and very far removed, as to strength, from the true Vultures; thus they fall more furiously upon carrion and other species of filth, which attract them from afar; they do not even disdain to feed upon excrement. They were comprehended by Illiger, along with the preceding, among his Cathartes.

Vult. percnopterus, L.; *V. leucocephalus* and *V. fuscus*, Gm. Enl. 407 and 429; Vieillot, Galer. 2; Naum. pl. 3; *Vult. de Gingi*, Sonn. and Daud.; *Origourap*, Vaill. Afr. 14; *Rachamah*, Bruce; *Pharaoh's Bird*, in Egypt. As large as a crow; throat and cheeks naked; the adult male white, quills of the wings black; the young and the female, brown. This bird is found throughout the whole of the eastern continent, and is particularly common in warm countries, where it is an excellent scavenger, purifying them from carrion, &c. It follows the caravans in the desert to devour all that dies. The ancient Egyptians held it in respect on account of the services it renders to the country, and frequently sculptured it on their monuments. Even at the present day it is exempt from injury, and pious Mussulmen sometimes bequeath sums of money for the maintenance of a certain number.

V. jota, Bonap.; Vieillot, Am. Sept. pl. 1. (The Urubu.) Of the size and form of the preceding; the beak stronger; the whole body of a brilliant black; the entire head naked. Common in all the hot and temperate parts of America, where it renders similar services as the Percnopterus in Egypt; flocking round dead bodies, and consuming every kind of filth.(2)

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(1) *Percnopterus*, black wings, the name of the Egyptian species, among the ancients.

(2) This bird has been confounded for a long time with the *aura*, but its beak is much more slender. Add the *Catharte moine*, Pl. Col. 222.

Gypaetos, Storr.—Phene, Savigny.

The Griffins, placed by Gmelin in the genus *Falco*, are more nearly allied to the Vultures in their habits and conformation ; their eyes are even with the head ; their talons proportionably weak ; wings half extended when at rest ; the crop, when full, projecting at the bottom of the neck ; but their head is completely covered with feathers. Their distinguishing characters consist in a very strong, straight beak, hooked at the end, and inflated on the curve ; nostrils covered by stiff hairs, directed forwards, and a pencil of similar ones under the beak ; their tarsi short and feathered to the toes ; their wings long, the third quill being the longest.

Vult. barbarus and *Falco barbatus*, Gm. Pl. Col. 431 ; Edw. 106 ; Vieillot, Gal. pl. 8 ; Nauman, pl. 4 and 5 ; *Nisser* of Bruce, Abyss. pl. 31. (*The Læmmer-geyer.*) The largest bird of prey belonging to the eastern continent, inhabiting the high chains of mountains, but not very common. It builds its nest on inaccessible acclivities, attacks lambs, goats, the chamois, and, as it is said, even man, when it finds him asleep ; it is asserted that children have been carried away by it. Its usual mode of attack is to force its prey from some precipice, which it then devours, being killed and mangled by the fall. It does not, however, reject dead bodies. Its length is nearly four feet, the distance from the tip of one wing to that of the other being from nine to ten. The mantle is blackish, with a white line on the middle of each feather ; the neck, and all the under part of the body are of a light and brilliant fawn-colour ; a black band surrounds the head. The neck and breast of the young, until the fourth year inclusive, are of a brown colour, more or less deep. This bird is the *Phène* of the Greeks, and the *Ossifraga* of the Latins.(1)

Falco, Lin.

The Falcons form the second, and by far most numerous division of the diurnal birds of prey. Their head and neck are covered with feathers ; their eye-brows project, which occasions the eye to appear sunk, and gives to their physiognomy a character very different from that of the Vultures : the greater number prey on living animals, but they differ in the courage with which they pursue it. Their first plumage is often very differently coloured from that of the adult,

(1) *Savigny*, Ois. d'Egyp. et de Syrie, p. 18, in the great work on Egypt, was the first who firmly established this synonyme.

which is only assumed in their third or fourth year, a circumstance which has occasioned a great multiplication of species. The female is generally one-third larger than the male, which, on this account, is styled a *tarsel*, or *tercel*. We should, first of all, subdivide this genus into two great sections.

NOBLE BIRDS OF PREY.

Falco, Bechst. Falcons, properly so called.

The true Falcons constitute the first, and, in proportion to their size, are the most courageous, a quality which is derived from the power of their arms and wings; their beak, curved from its base, has a sharp tooth on each side of its point, and the second quill of their wings is the longest, the first nearly equalling it, which renders the whole wing longer and more pointed. From this, also, result peculiar habits: the length of the quills of their wings diminishes their vertical power, and compels them, in a calm state of the atmosphere, to fly obliquely forwards, so that when they wish to rise directly upwards, they are obliged to fly against the wind. These birds are the most docile of all those employed by falconers, who teach them to pursue game, and to return at their call. Their wings are longer than their tails.

F. communis, Gm.(1) (The Common Falcon.) As large as a hen, and distinguished by a triangular, black moustache on the cheek, larger than that of any other species of the genus; it varies as to colours nearly in the following manner: when young, it is brown above, the feathers edged with reddish; underneath whitish, with longitudinal brown spots. As it increases in age, the spots on the belly and thighs have a tendency to form transverse blackish lines, and the white increases on the throat and root of the neck; the plumage on the back, at the same time, becomes more uniform, and is of a brown, transversely striped with a blackish ash colour; the tail is brown above, with pairs of reddish spots, and beneath with pale bands which diminish in width with age; the throat is always white; the feet and the cera of the beak are sometimes blue and sometimes yellow. These variations may be followed, Enl. 470, the young;

(1) We must take especial care not to refer to this species the pretended varieties of the *Falco communis* given by Gmelin. Thus the var. α, Frisch. 74, is a Buzzard; δ, Id. 75, is a Booted Buzzard; ϵ, Id. 80, the *Falco pygargus*, L.; θ, Id. 76, a Buzzard somewhat paler than usual; $\varkappa$, Aldrov. 494, a very distinct species, &c. On the contrary, the *F. islandicus*, *barbarus* and *peregrinus* may all be the Common Falcon at different periods of moulting.

421, the old female ; 450, the old male ;(1) Nauman, pl. 24 and 25, and Wils. Am. IX, pl. lxxvi.

Those called *Faucons pélerins*, Enl. 469, and Wils. Amer. IX, pl. 76—*F. stellaris*, *F. peregrinus*, Gm., appear to be young ones rather blacker than the rest.

It is this celebrated species which has given its name to that kind of hunting in which birds of prey are used. It inhabits the whole north of the earth, and builds in the most elevated and inaccessible cliffs. Such is the velocity of its flight, that there is scarcely a spot on the globe it does not visit. The Falcon stoops vertically on its prey, as though it fell from the clouds, and consequently can only capture birds while on the wing, otherwise it would dash itself against the ground, &c. with fatal violence. The male is used for taking Pies and other small birds; the female against Pheasants, and even Hares.

F. lanarius, L.; *F. sacer*, Naum. pl. 23. (The Lanner.) A somewhat larger species, which appears to come from the East rather than the North. Its plumage is nearly the same as that of the young falcon, except that its moustache is narrower, and less marked, and that its throat is mottled ; it approaches the Gerfalcon in the tail, which is longer than the wings : it is principally taken in Hungary.

Europe produces also six smaller species, three of which have the form and qualities of the true falcon on a reduced scale.

F. subbuteo, L.; Enl. 432 ; Naum. 26. (The Hobby.) Brown above ; whitish, spotted longitudinally with brown beneath ; thighs and lower part of the abdomen red ; a brown streak on the cheek.

F. æsalon, L.; Enl. 468; Naum. 27. (The Merlin.) Brown above; whitish beneath; longitudinally spotted with brown, even on the thighs ; the smallest of the European birds of prey. *F. lithofalco*, L.; Enl. 447; ash coloured above; reddish white spotted longitudinally with pale brown underneath, is merely an old male of the same species. Builds among the rocks.

The toes of the three remaining species are shorter, and their tubercles less salient. Their flight is not so rapid, and they pursue Mice, Insects, and seize Birds upon the perch. The most common is,

F. tinnunculus, L.; Enl. 401 and 471 ; Naum. 30. (The Kestrel.) Red ; spotted with black above; white longitudinally, spotted with pale brown beneath ; the head and tail of the male

(1) Frisch only gives a young falcon, pl. lxxxiii, Edw.; the old female, pl. iii ; the young, pl. iv.

ash coloured. The name is derived from its shrill cry ; builds in old towers, &c.

F. cenchris, Frisch and Naum.; *F. tinnunculoides*, Schintz and Temm.; Naum. 29; Frisch, 89. (The Little Kestrel.) Immaculate above; otherwise similar to the Kestrel ; wings rather longer, and talons white. This species, long confounded with the preceding, prefers the south of Europe.

F. rufipes, Beseke; *F. vespertinus*, Gm.; Enl. 431; Naum. 28. (The Grey Kestrel.) The male is of a deep ash colour; the thighs and inferior part of the abdomen red ; the back of the female ash coloured, spotted with black ; the head, and all beneath, more or less red. Still smaller than the preceding ; most common in eastern Europe, common, also, in Siberia—rare in Germany and France.(1)

Hierofalco, Cuv.(2)

The Gerfalcons have wing quills similar to those of the other noble birds, which they perfectly resemble in disposition ; but their beak has only an emargination like that of the ignoble ones;(3) their long and displayed tail extends considerably beyond their wings, although the latter are very long ; the superior third of their tarsi, which are short and reticulated, is furnished with feathers. Only one species is well known.

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(1) Of foreign species *add*, 1st, allied to the Kestrel : *Le Montagnard*, Vaill. 35 (*F. capensis*, Sh.).—*F. sparverius*, Enl. 465, Wils. II. xvi, 1, and IV, xxxii, 2, and two or three species, whose wings, otherwise similar to the noble birds of prey as to the relative proportion of the feathers, are shorter than the tail ; such as the *F. punctatus*, Cuv. Col. 45.—*F. columbarius*, Wils. II, xv, 3.

2d. Allied to the Hobby : *F. cærulescens*, Edw. 108, Vieill. Gal. 18, and Col. 97, hardly larger than a swallow ;—*F. aurantius*, Lath., *rufogularis*, Ejd., *thoracicus*, Illig. Col. 348 ;—*F. bidentatus*, Lath., or *Bidens rufiventer*, Spix. VI, which is distinguished by a double tooth in its beak, Col. 38, and the young, Col. 358, or *Bid. albiventer*, Spix. VII, but with the wings too short ;—*F. diodon*, Col. 198 ;—*F. femoralis*, Temm. Col. 121 and 343, and Spix. VIII ;—*F. Aldovandii*, Reinw. Col. 128.

3d. Allied to the True Falcon: the *Chiquera*, Vaill. Afric. 30 (*F. chiquera*, Sh.);—*F. biarmicus*, T. Col. 324 ;—the *F. huppé* (*F. frontalis*, Daud., *F. galericulatus*, Sh.), Vaill. Afric. 28 ;—the *F. huppart*, T. (*F. lophotes*, Cuv.) Enl. 10 ;—the *F. à culotte noire*, Vaill. 29 (*F. tibialis*, Sh.).

(2) *Hierax*, *Hiero-falco*, *Sacred Falcon*, &c. names connected with the superstitions of the Egyptians respecting certain birds of prey. *Gerfalcon* is a corruption of *Hiero-falco*.

(3) Nauman, I, p. 278, asserts that it is the falconers who round the tooth of the beak in the Gerfalcons. In that case, and with the bare exception of their long tail, they would re-enter the catalogue of the other Falcons, and the *Lanner* should be associated with them.

F. candicans and *F. islandicus*, Gm.; Buff. Enl. 210, 456, 462; Naum. 21, 22. (The Gerfalcon.) One fourth larger than the Falcon, and the most highly esteemed by falconers. It is chiefly obtained from the north; its usual plumage is brown above, with an edging of paler points on each feather, and transverse lines on the coverts and quills; the tail is striped brown and greyish; but it so varies in the proportion of the brown and white, that the body of some of them is altogether white, and all that remains of the brown is a spot on the middle of each feather of the mantle; the feet and the membrane of the beak are sometimes yellow, sometimes blue.(1)

The second section of the great genus *Falco* is that of the

IGNOBLE BIRDS OF PREY.

So called, because they cannot be easily employed in falconry; a tribe much more numerous than that of the Nobles, and which it is also necessary to subdivide considerably. The fourth quill of their wings is almost always the longest, and the first is very short, which produces the same effect as if their wing had been obliquely truncated at the tip, whence, cœteris paribus, result diminished powers of flight; their beak also is not so well armed, there being no lateral tooth near its point, but a mere slight emargination about the middle of its length.

Aquila, Briss.

The Eagles, which constitute the first tribe, have a very strong beak, straight at base and only curved towards the point. Among them we find the largest species of the genus, and the most powerful of all the birds of prey.

Aquila, Cuv.

Eagles, properly so called, have the tarsi feathered down to the root of the toes; they inhabit mountains, and pursue Birds and Quadrupeds; their wings are as long as the tail, their flight as high as it is swift, and their courage superior to that of all other Birds.

F. fulvus, *F. melanaëtos*, *F. niger*, Gm.;(2) Enl. 409; Naum.

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(1) Add as a foreign species, the *Cinereous Gerfalcon*, (*F. atricapillus*,) Wils. VI, lii, 3, of which the *Cinereous Buzzard*, Edw. 53, (*F. cinereus*, Gm.;) is possibly a young specimen.

(2) The real species is well represented, Enl. 409; it is *Falc. fulvus*. At certain stages of moulting, the white at the base of the feathers may be seen; it then forms the *F. fulvus canadensis*, Edw. 1. As to the *F. melanaëtos*, it is merely based upon some vague indications of the ancients, and the same only is quoted

pl. 8 and 9; Wils. VII, lv, 1. (The Common Eagle.) More or less brown; the occiput fawn coloured; the superior half of the tail white, and the remainder black. The most common species in all mountainous countries.

F. chrysaëtos, Enl. 410. (The Ring-Tail Eagle.) Only differs from the preceding in its blackish tail, marked with irregular ash coloured bands. We are assured that it is the Common Eagle, with its perfect plumage (1)

F. imperialis, Bechst.; *F. mogilnik*, Gm.; *Aquila heliaca*, Savig. Eg. Ois. pl. xiii; Vieillot, Gal. 9; Naum. pl. 6 and 7. Tem. Col. 15 and 152. (The Imperial Eagle.) Still longer wings; a large whitish spot on the scapulars; the nostrils transverse; the tail black; the superior portion undulated with grey. The female is fawn coloured, with brown spots. Its port is heavier than that of the Common Eagle, and it is a still more fearful object to other Birds. It inhabits the high mountains of the south of Europe, and is the true subject of the exaggerated tales propagated by the ancients, relating to the power, courage, and magnanimity of their Golden Eagle.

F. nævius, and *F. maculatus*, Gm.; Naum. pl. 10 and 11; *Aq. melanaëtos*, Savig. Eg. Ois. pl. 1 and pl. 2, f. 1. (The Spotted Eagle.) A third less than the two others; tarsi more slender; plumage brown; tail blackish, with paler bands; pale, fawn coloured spots, form a band on the small coverts; one at the tips of the large ones which mounts to the scapulars, and one at the tips of the secondary quills. The superior part of the wing is sprinkled with fawn colour. The old birds become all brown. This species is common in the Apennines, and other mountains of the south of Europe; but is rarely seen in the north; it attacks the weaker animals only. It has been found sufficiently docile to be employed in falconry, but is said to fly from and be vanquished by the Sparrowhawk.

It has been thought proper to place among the Eagles a bird of Eastern Europe—*Falco pennatus*, Gm.; Col. 33.; Briss., Suppl. pl. 1, which scarcely resembles them in any thing except the plumed tarsi and pointed feathers of the vertex, but which is not as large as the Buzzard, and has a beak almost as much curved; its plumage is fawn coloured spotted with brown, its feet blue. Very rare in France and Germany.(2)

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in pl. Enl. 409. Finally, the *F. Niger*, or *Black-backed Eagle* of Brown, is merely a slight difference of age.

(1) Temm. Man. d'Ornith. I, p. 39.

(2) A living specimen, however, was taken near Paris in 1828. M. Temm.

New Holland produces Eagles similar in form to those of Europe, the tail excepted, which is cuneiform (*etagée*).(1)

HALIÆTUS, Savig.—The FISHER EAGLES, Cuv.

The Fisher Eagles have the same wings as the preceding, but only the upper half of their tarsi invested with feathers, the remainder being semi-scutellated. They frequent the shores of rivers and of the sea, and feed chiefly on fish.

F. ossifragus, *F. albicilla*, and *F. albicaudus*, Gm. (The Ossifragus and Pygargus.) Form but one species, which at first has a black beak; tail blackish, spotted with white, and the plumage brownish, with a deep brown streak on the middle of each feather, (Enl. 112 and 415; Naum. 14; the *F. ossifragus*,) and which, when older, becomes of a uniform brownish grey, paler on the head and neck, with an entirely white tail, and the beak of a pale yellow. (Frisch, lxx; Naum. 12 and 13—the *F. albicilla*.)(2) It generally attacks fish, and is found in the whole north of the globe.

F. leucocephalus, L.; Enl. 411; Wilson, IV, xxxvi, and VII., lv, 2. (The Bald Eagle.) A uniform deep brown; head and tail white; beak yellowish, and almost as large as the Common Eagle of Europe. It inhabits North America, and is continually occupied in fishing. It appears occasionally in the north of Europe. When young, the head and body are of a cinereous brown. It must not be confounded, however, with the old White-Headed Pygargus.

F. ponticerianus, Gm.; Enl. 416; Vieillot, Gal. 10. (The Garuda.) Less than a Kite; of a fine lively chesnut red; head, neck and breast, white, or pearl grey. It is from India, and is the *Garuda Eagle*, which, in the religion of the Bramins, is sacred to Vishnu.(3)

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makes an European species of the *Aigle Bonnelli*, Col. 288; but we have not got it in all its states.

Add the *Griffard*, Vaill. Afric. I, (*F. armiger*, Sh.);—the *Malay eagle*, (*F. malaiensis*, Reinw.) Col. 117;—the *Petit Aigle de Scnegal*, (*F. Scnegallus*, Cuv.) similar to the Spotted, or Little Eagle of Europe; the nostrils not so round, numerous small, grey bands underneath the tail of the young.—The *Petit Aigle du Cap*, (*F. nævioides*, Cuv.) variegated with brown fawn colour and blackish.

(1) *F. fuscosus*, Col. 32.

(2) This change has been verified more than once in the menagerie of the museum. As to the Little Pygargus, *F. Albicaudus;* it is merely the male of the great one, *F. albicilla*.

(3) Here should come the *Blagre*, Vaill. Afric. 5, (*Falc. blagrus*, Sh.) which is probably the *F. leucogaster*, Lath. or *Aigle oceanique*, Col. 49;—the *vocifer*, Vaill. Af. 4 (*F. vocifer*, Sh.;—the *Aigle de Macé* of Bengal, (*F. macei*, Cuv.) Col. 8 and 223;—the

PANDION, Savigny.

The Ospreys have the beak and feet of the Fisher Eagles; but their claws are round underneath, while in other birds of prey they are grooved or channelled; their tarsi are reticulated, and the second quill of their wings is the longest.

Only one species is known, which is found along the shores of fresh waters in almost every part of the globe, varying but little in plumage: it is the

Falco haliætus, L.; Enl. 414, and better, Catesby, II; Wils. V, xxxvii; Vieillot, Gal. ii; Naum. 16. (The Osprey.) A third smaller than the Ossifragus; white, with a brown mantle; a brown band descending from the angle of the beak towards the back; brown spots on the head and neck, also a few on the breast; the *cera* and feet, sometimes yellow, and sometimes blue. The species of the genus

CIRCAETUS, Vieillot,

Are in a manner intermediate between the Fisher-Eagles, the Ospreys and the Buzzards. They have the wings of the Eagle and Buzzard, and the reticulated tarsi of the Osprey.

F. gallicus, Gm.; *F. leucopsis*, Bechst.; *F. brachydactylus*, Tem.; Enl. 413; Naum. 15; *Jean le Blanc.* Superior in size to the Osprey; the curvature of its beak is more sudden than in the other Eagles, and the toes are shorter in proportion. It is brown above, white beneath, with pale brown spots; three light bands on the tail. Its carriage is rather that of a Buzzard than of an Eagle, and it feeds chiefly on Frogs and Serpents.

F. ecaudatus, Sh.; *Le Bateleur*, Vaill. Afric. 7 and 8. An African species, remarkable for the extreme shortness of its tail, and its beautifully variegated plumage. The *cera* of its beak is red.(1)

America produces Eagles with long wings, like the preceding ones, and naked scutellated tarsi, in which a more or less considerable portion of the sides of the head, and sometimes of the throat, is

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Aigle aguia, (*F. aguia*, T.) Col. 302;—the *F. ichtyætus*, Horsf. Jav.;—the *Milvago ochrocephalus*, Sp. I, or *Chimachima*, Azz. or *F. degener*, Illig. We should also remember that the transition from the Eagles to the Buzzards is effected by insensible gradations.

(1) Add the Crowned Eagle, Azz. (*F. coronatus*, Tem.) Col. 234;—the *Circaète du Sénégal*, (*C. cinereus*,) Vieill. Gal. pl. xii;—the *Caracara funebra*, (*F. Novæ Zelandiæ*, Lat.) Col. 192 and 224.

destitute of feathers. They have received the common name of Caracara.(1)

F. braziliensis, Gm.; *Polyborus vulgaris*, Vieillot, Galer. pl. 7; the young, Spix, I. Large as an Osprey; striped transversely, with white and black; feathers long and slender, and white on the throat; a black calotte slightly elongated into a crest; the wing covers, thighs, and tip of the tail, blackish. The most common bird of prey in Paraguay and Brazil.(2)

F. aquilinus, Gm.; Enl. 417; *Ibycter leuco-gaster*, Vieillot, Galer. 6. Black; the abdomen and inferior coverts of the tail white; throat, naked and red. The

Harpyia, Cuv.(3)

Or Fisher-Eagles with short wings, are also American Eagles, whose tarsi are very thick, strong, reticulated, and half covered with feathers like those of the true Fisher Eagles, from which they only differ in the shortness of their wings; their beak and claws are even stronger than those of any other tribe.

The Great Harpy of America; Aigle destructeur of Daudin; *Grand Aigle de la Guiane* of Mauduit, and probably the *Falco harpyia* and the *F. cristatus*, Lin.; *F. Harpyia* and *imperialis*, Sh. Col. 14.(4) Of all birds, this possesses the most terrific beak and claws; it is superior in size to the common eagle; the plumage is ash coloured on the head and neck; the mantle and the sides of the breast, a blackish brown; whitish above, and striped with brown on the thighs: it has a black tuft on the back of the head, formed of long feathers, and when it erects them and removes those on the cheeks, its physiognomy greatly resembles that of the *Strix ulula*, Gm. Its external toe is also very frequently directed backwards, like the thumb. Such are its powers, that

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(1) Azzara, Voy, iii, p. 30, et seq.

(2) It is the true Caracara of Marcgrave, though it could never be recognized from the description. A better one may be found in Azzara. Our own is taken from nature. The *F. cheriway*, Jacq. Beyt. p. 15, No. 11, may easily be a variety from age. Add the *Black Caracara*, Tem. (*F. aterrimus*, T.) Col. 37 and 342, or *Daptrius ater*, Vieill. Gal. pl. v;—*Gymnops fasciatus*, Spix, IV. His *Gymnops strigilatus* is the young of the same.

N. B. It is from my Caracaras that Vieillot has made his genera Daptrius, Ibycter, and Polyborus, according to the greater or less extent of the bare spot on the head.

(3) Vieillot has adopted this genus and name.

(4) It is most certainly the *Yzquautzli* of Fernandez; but that author greatly exaggerates its size in comparing it to a sheep. It is also the *V. cristatus* of Jacq., and consequently the *Falc. Jacquini* of Gmelin.

it is said to have cleft a man's skull with its beak; its ordinary food is the Sloth, and it frequently carries off Fawns.

Morhpnus, Cuv.(1)

The Morphni, like the preceding, have wings shorter than the tail; but their elevated and slender tarsi compel us to separate them.

Some of them have naked and scutellated tarsi.

F. guianensis, Daud.; *Petit Aigle de la Guiane*, Maud. Encyc. It has singular resemblance in colour and crest to the Great Fisher Eagle of the same country; but it is not so large, and its naked and scutellated tarsi sufficiently distinguish it; the mantle is blackish, sometimes variegated with a deep grey; abdomen white, undulated more or less strongly with fawn colour; head and neck sometimes grey, and sometimes white; the occipital tuft, long and blackish.

F. urubitinga, L.; Spix, I. Black; no crest; rump and base of the tail, white. When young, brown above; fawn coloured, sprinkled with brown beneath (Col. 55). This beautiful bird hunts on inundated grounds.(2)

Others have elevated tarsi feathered throughout.

F. occipitalis, Daud.; *Huppart*, Vaill. Afr. I, ii; Bruce, Abyss. pl. xxxii. As large as a Crow; black; a long crest or tuft pendent from the occiput; the tarsi, borders of the wings, and of the bands under the tail, whitish. Throughout all Africa.

F. ornatus, Daud.;(3) *F. superbus* and *coronatus*, Sh.; *Crested Goshawk*, Vaill. Afric. I, xxvi; *Spizaetus ornatus*, Vieillot, Galer. 21; *Aigle moyen de la Guiane*, Maud. Encyclop.; *Booted Sparrowhawk*, Azz. Calotte, and crests black; sides of the neck of a bright red; mantle black, variegated with grey, undulated with white; above, white; flanks, thighs, and tarsi striped with black; tail, black, with four grey bands. A beautiful bird of South America, varying from black and white to a deep brown.(4)

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(1) *Morphnus*, the Greek name for an undetermined bird of prey. It is from my Morphnus that Vieillot has made his Spizaetes.

(2) The *Falco longipes*, Illig.; the *Aq. picta*, Spix, I, appear to me to be young Urubitingæ.—Add the *Aigle-autour moucheté*, (*Aq. maculosa*,) Veill. Amer. pl. iii, bis;—the *Panema*, (*Aq. milvoïdes*) Spix, Id.

(3) This is certainly the *Urutaurana* of Marcgrave; but that author describes it as being of the size of an Eagle, which is at least one-third too large. The *Harpyia braccata*, Spix, III, is the young bird of the same species.

(4) Add here, of crested species, the *blanchard*, Vaill. Afr. 3, (*F. albescens*, Sh.);

Finally, America produces birds with beaks similar to the preceding ones; very short reticulated tarsi half covered with feathers in front; wings shorter than the tail, and whose most distinguishing character consists in their nostrils, which resemble fissures. We may form them into a small tribe under the name of Cymindis, Cuv. (1) Such is

F. Cayennensis, Gm.; *Le Petit Autour* de Cayenne, Buff. Enl. 473; Spix, VIII. It has another peculiar character in a small tooth at the spot where the beak curves. The adult is white, with a bluish-black mantle, cinereous head, and four white bands on the tail; in the young bird the mantle is variegated with brown and red, and the head is white, with some black spots. (2)

Astur, Bechst.—Daedelion, Savig.

The Goshawks, which form the second division of the Ignobles, like the last three tribes of Eagles, have wings shorter than their tail; but their beak is curved from its base, as in all those which are to follow. We particularly designate as Goshawks those which have rather short and scutellated tarsi.

F. palumbarius, L.; Enl. 418 and 461; and the young *F. gallinarius*, Gm. Enl. 425; and Frisch, LXXII; Naum. 17 and 18. (3) (The Common Goshawk.) The only species in France; brown above, with white eye-brows; white beneath; the adult transversely striped with brown; longitudinally sprinkled when young; five browner bands on the tail. It equals the Gerfalcon in size, but not in courage; always stooping obliquely upon its prey. Falconers, however, sometimes use it for the weaker kinds of game. Common in hills and low mountains.

Among foreign Goshawks, we may remark that of New Holland, *Falco Novæ Hollandiæ*, White, Voy. p. 250, which is very often entirely of a snow white; but it seems that it is a va-

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—*F. tyrannus*, Pr. Max. Col. 73; *L'Autour cristatelle*, Temm. Col. 285: of species without crests, *l'Autour neigeux*, Temm. Col. 127;—*P.Aut. incolore*, Id. ib. 134, or *Falco lineatus*, Horsf. Java.

(1) *Cymindis*, the Greek name for an undetermined bird of prey.

(2) I am not sure whether it is not a young Cymindis that is represented in the *Buse mantelée*, (*F. palliatus*, Tem.) Col. 204, very different from that which has the same French name, Col. 437.

Add the *F. hamatus*, Illig. Col. 61 and 231, *F. leucopygus*, Spix, II, the *F. uncinatus*, Id. Col. 103, 104, 105. These birds vary greatly in colour with age.

N. B. The *Gottingen Eagle*, (*F. glaucopis*, Merrem. Beytr. II, pl. vii,) is a Common Buzzard. The *White Eagle* (*F. albus*, Sh.; John White, Voy.) is a Goshawk.

(3) Also probably *F. gyrfalco*, *F. gentilis*, Gm;—so badly determined were the birds of prey at the period of the first edition.

riety of a bird of the same country, which is ash coloured above, white beneath, with vestiges of grey undulations.(1)

We may also approximate to the Goshawks some American birds with short wings and tarsi; the latter, however, reticulated.

F. cachinnans, L.; *Nacagua*, Azz.; Vieill. Gal. 19; Spix, III. (The Laughing Falcon.) So called from its cry; white; the mantle and a band which extends from the circumference of the eye to the neck, where it joins a corresponding one on the opposite side, brown; brown and white bands on the tail. From the marshes of South America, where it feeds on Reptiles and Fish.(2)

The name of Sparrowhawk, (Nisus, Cuv.) is generally appropriated to those whose tarsi are higher and scutellated; but the transitions from one division to the other are almost insensible.

F. nisus, L.; *Epervier Commun*, Enl. 412 and 467; Naum. 19, 20. (The Common Sparrowhawk.) Coloured like the Goshawk, but its legs are longer, and it is a third less in size. It is employed however by falconers. The spots beneath on the young bird red and arrow-shaped, or like elongated tears—the feathers of its mantle are also edged with red.

There are foreign species still smaller;(3) but there are some also much larger.

F. musicus, Daud.; *Faucon chanteur*, Vaill. Afric. xxvii. As large as the Goshawk; cinereous above; beneath, and the rump, white, streaked with brown; brown, varied with red, when young. Found in Africa, where it pursues partridges and hares, and builds on trees. The only bird of prey known that sings agreeably.(4)

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(1) Other foreign goshawks, *F. poliogaster*, Tem. Col. 264 and 295;—*F. trivirgatus*, Tem. Col. 303;—*F. leucauchen*, Tem. Col. 306;—*F. radiatus*, Lath. Col. 123, *l'Aut. poliosome*, Quoy and Gaym. Voy. de Freycin. pl. xiv;—*F. leucorrhous*, Ib. pl. xiii;—*F. unicinctus*, Tem. col. 313. These three last, in shape, closely resemble the *urubitinga*. The *F. pennsylvanicus*, Wils. IV, liv, 1;—the *F. borealis*, L. Vieill. Am. pl. xiv, bis; Wils. li, 1;—*F. leverianus*, Wils. lii, 2;—*F. striolatus*, T. Col. 87 and 294, or *Asturine cendrée*, Vieill. Gal. 20;—*F. monogrammicus*, T. Col. 314;—*F. Dussumieri*, T. Col. 308 and 386. The latter conduct us insensibly to the Sparrowhawks.

N. B. The *F. cærulescens* forms the genus Hierax of Vigors: the species with two teeth, as the *bidentatus*, &c. or the Bidens of Spix, are the Harpagus of the same gentleman.

(2) Here comes the *F. melanops*, Lath. Col. 105. It is from this subdivision that Vieillot has made his Herpethotheres.

(3) As the *Gabar*, Vaill. Afr. 33, (*F. Gabar*, Sh.) Col. 122 and 140;—the *F. minullus*, Sh.

(4) Other Sparrow-Hawks foreign to Europe: *The Mixed Lead-coloured Buzzard*, Azz. No. 67, (*F. hemidactilus*, T.) Col. 3 and 91; *Falc. magnirostris*, Enlum. 460,

MILVUS, Bechstein.

The Kites have short tarsi, and weak toes and nails, which, added to a beak equally disproportioned to their size, render them the most cowardly species of the whole genus; they are distinguished by their excessively long wings, and their forked tail, which give them great powers of flight.

Some of them have very short tarsi, which are reticulated and half invested with feathers above, like the last small tribe of eagles, (the ELANUS, Savigny). Such are,

Falco melanopterus, Daud.; *Le Blac*, Sav. Eg. Ois. pl. 2, f. 2; Vaill. Afr. xxxvi and xxxvii; Bonap. Am. II, xi, 1. As large as a Sparrowhawk; plumage soft and silky; tail but slightly forked; cinereous above; white beneath; the small wing coverts blackish: the young is brown, varied with fawn colour. This bird is common from Egypt to the Cape, and appears to be found in India, and even in America.(1) Insects are almost its only game.

F. furcatus, L.; *The fork-tailed Kite*, Catesb. iv; Wils. li, 2; Vieillot, Am. 10. White; wings and tail black; the two external quills of the latter very long; larger than the preceding. It attacks reptiles.(2)

KITES, *properly so called*,

Have stronger and scutellated tarsi.

F. milvus, L.; *Milan commun*, Enl. 422; Naum. 31, f. 1. Fawn coloured; quills of the wings, black; tail, red; of all the birds of Europe this remains longest and most tranquilly on the wing. It usually attacks nothing but reptiles.(3)

Col. 86;—*Falco columbarius*, Catesb. 4, Vieill. Am. pl. 2 and Wils. II. xv, 3;—*Ep. tachiro*, Vaill. Afr. 24, (*F. tachiro*, Daud.) Col. 377 and 420;—*F. cuculoides*, Temm. Col. 110 and 129;—*F. xanthothorax*, T. Col. 92; *F. virgatus*, T. Col. 109;—*F. brachipterus*, T. Col. 14 and 116, or *F. concentricus*, Illig.;—*F. pileatus*, Pr. Max. Col. 205;—*F. gymnogenys*, Col. 307; *F. pennsylvanicus*, Wils. VI, xlvi, 1; very different from the Goshawk so called, Id. pl. liv, and the young, col. 67;—*F. velox*, Wils. VI, xlv, 1, is the young female of it, according to Charles Bonap.;—*F. lineatus*, Wils. VI, liii, 3;—*F. hiemalis*, Wils. IV, xxxv, 1;—*F. striatus*, Vieill. Am. pl. 14;—*F. niger*, Vieill. Gal. 22. *See Append. XIII of Am. Ed.*

(1) This we consider a mistake of our author; it has never been found in this country. The bird alluded to has been ascertained by Temminck to be a distinct species, and is called by him *F. dispar*. *Am. Ed.*

(2) Add the *F. riocourii*, Vieill. Col. 85;—the *Irregular-tailed Kite*, (*F. dispar*, Tem.) Col. 319.

(3) Add the *Parasite*, Vaill. Afr. 22, or the *Milan noir*, Enl. 472, Naum. 31, f. 2; Savigny, Eg. Ois. pl. iii, f. 1, is the *Falc. ater*, *F. ægyptius*, and the *Falc. fors-*

Pernis, Cuv. (1)

The Honey-Buzzards, with the weak beak of the Kites, have a very peculiar character in the space between the eye and the beak, which, in all the rest of the genus Falco, is naked, and simply furnished with a few hairs, but in these is covered with a dense plumage, the feathers of which are cut like scales; their tarsi are half feathered above and reticulated: their tail is equal, wings long, and their beak curved from its base like all those which follow. There is but one species in Europe.

F. apivorus; la Bondrée Commune, Enl. 420; Naum. 35, 36. (The Common Honey-Buzzard.) Somewhat smaller than the Buzzard; brown above; variously undulated with brown and whitish beneath; the head of the male ash coloured at a certain age. It pursues Insects, and, principally, Bees and Wasps.

There are some others in foreign countries.

P. cristata, Cuv. (The crested Honey-Buzzard of Java.) All brown; head, ash coloured, like that of Europe; but it has a black tail, with a whitish band on the middle; a brown crest on the occiput. Brought from Java by M. Leschenault.(2)

Buteo, Bechstein.

The Buzzards have long wings; the tail equal; the beak curved from its base; the space between it and the eyes, naked; the feet, strong.

The tarsi of some of them are feathered down to the toes. They are distinguished from the Eagles by the curving of their beak from the base, and from the Goshawks, or Goshawk-Eagles, with feathered tarsi, by their long wings.

F. lagopus, Gm.;(2) *the Booted Buzzard*, Frisch, lxxv; Vaill. Afr. xviii; Wilson, IV, xxxiii, 1; Naum. 34. Irregularly variegated with a darker or lighter brown, and a more or less yellowish white. It is one of the most universally diffused birds;

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kahlii, Gmel., the *F. parasiticus*, Lath. and Shaw;—*F. mississipiensis*, Wils. III, xxxv, 1, or the *Ictinie ophiophage*, Vieill. Galer. pl. 17.

N. B. The *Falc. austriacus*, Gmel., is the young of the Common Kite.

(1) *Pernis* or *pernes*, according to Aristotle, the name of some bird of prey.

N. B. The *F. riocourii* forms the genus Nauclerus of Vigors.

(2) M. Temminck has figured this bird, (Col. 44,) under the name of *Buse ptilorinque*.

(3) It is the *Falco lagopus*, Brit. Zool. Ap. vol. i; the *Falco communis & leucocephalus*, Frisch, 75; the *Falco Sancti Johannis*, Arct. Zool. pl. ix; the *Falc. communis fuscus*, *F. variegatus*, *F. albidus*, *F. versicolor*, Gm. are merely different states of the Common Buzzard.

it is found every where, and has almost always been considered as a variety of some other bird.(1)

But the greater number of Buzzards have naked and scutellated tarsi. The only one in Europe is,

F. buteo, L.; *la Buse Commune*, Enl. 419; Naum. 32. (The Common Buzzard.) Brown; belly and throat more or less undulated with white; the most noxious and common bird of prey in Europe. It remains the whole year in the forests, souses upon its prey from the top of a tree, and destroys much game.(2)

Some species are crested.

Le Bacha, Vaill. Afric. pl. xv. Size of the preceding; brown; small, white, round spots on the sides of the breast, and on the abdomen; a black and white crest; a broad white band on the middle of the tail. A very savage bird of Africa, which preys chiefly on the Hyraces.(3)

Circus, Bechstein.

The Harriers differ from the Buzzards in their elevated tarsi, and in a kind of collar on each side of their neck, formed by the tips of the feathers which cover their ears.

There are three species in France, which have been multiplied by the nomenclaturalists on account of the variety in their plumage.

F. pygargus, L.; *La Soubuse*, Enl. 443 and 480; Naum. xxxviii, 2, and xxxix, 1 and 2. Brown above; underneath, fawn coloured,

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(1) Add the *Buse a calotte noire*, (*F. atricapillus*, Cuv.) Col. 79, or the *Buteo melanoleucos*, Vieill. Galer. 14;—the *Black Buzzard* (*F. niger*,) Wils. VI, liii, 1 and 2, which M. Ch. Bonap. thinks is the *F. Sanct. Johan.* of Pennant.

(2) Add the *Rou-noir*, Vaill. Afr. 16 (*F. jackal*, Daud. and Sh.);—the *Tachard*, Id. 19 (*F. tachardus*, Sh.);—the *Buseray*, Id. 20 (*F. bursarellus*, Sh.);—the *Grey cheeked Buzzard* (*F. polygenis*, Tem.) Col. 325.—the *Brown buzzard*, (*F. fuscus*) Vieill. Am. 5;—the *Tuchiro*, Vaill. 24 (*F. tachiro*, Sh.)—the *Milan Cresserelle*, Vieill. Am. 10, bis, and the young female, Col. 180; a species of which the *F. plumbeus*, Spix, VIII, is perhaps the adult, and in which the lateral festoon, in some individuals, is sharpened into a tooth, although the quills are those of the ignobles.—The *Long-winged Buzzard* (*F. pterocles*, Tem.) Col. 56 and 139.—The *Buse à dos tacheté* (*F. pœcilonotos*, Cuv.), Col. 9.—La *Buse mantelée*, (*F. lacernulatus*, T.) Col. 427.—La *buse pale*, (*F. liventer*, T.) Col. 438.—La *Buse à queue ferrugineuse*, (*But. ferruginicaudus*,) Vieill. Am. 6.

Also, *F. borealis*, Wils. pl. lii, f. 1. *Am. Ed.*

(3) Add the *White-crested Buzzard of India*, (*F. albidus*, T.) Col. 19.

N. B. The *Buse roussatre*, Tem. Col. 25, somewhat approaches to the Harrier by its elevated tarsi, but is deficient in the collar; the transitions between these two divisions, also, are almost insensible.

longitudinally spotted with brown ; the rump white. The *Hen Harrier—Falco cyaneus* and *F. albicans*,(1) Enl. 450; Naum. xxxix, 1; cinereous, with black wing quills, is merely the male in its second year. This species builds on the ground, keeps constantly in the fields, flies near the earth, and towards night hunts rats, young partridges, &c.

F. cineraceus, Montag.; *Le Busard Cendré*, Naum. 40 ; Vieill. Galer. pl. 13. More slender than the Soubuse, and with longer wings ; the old male is cinereous ; its primary quills, and a band on the secondary ones, are black ; both male and female, in the second year, are brown above, white beneath, with brownish streaks on the breast ; the whole under part of the young bird is red. Its habits are much like those of the preceding species.

F. rufus, L.; *La Harpaye ;* Enl. 470 ; Naum. 37, 1. Brownish and reddish ; the tail, and primary quills of the wings, cinereous. The *Busard du marais—Falco æruginosus*, Enl. 424 ; Naum. 38, brown, with a light fawn colour on the head and breast, is considered as the same bird at a more advanced age ; but some observers pretend it is a different species. Both of them keep within reach of water courses, in order to hunt reptiles.(2) Finally, the

Serpentarius, Cuv.—Gypogeranus, Illig.(3)

The Snake-Eater, or Secretary, is an African bird of prey, whose tarsi are at least double the length of those of the preceding ones, which caused some naturalists to place it among the

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(1) It is also the *F. communis*, *F. albus*, Frisch, pl. lxxv, the *F. montanus*, B, the *F. griseus*, Gm. and even his *F. bohemicus*.

N. B. The *M. cresserelle* of Vieillot has become his genus Ictinia.

(2) Add the *Acoli*, Vaill. Afr. 31 (*F. acoli*, Sh.);—the *Tchoug*, Id. 32, and Sonnerat, II, 182 (*F. melanoleucos*).—*F. palustris*, Pr. Max. Col. 22.—The *Frogeater*, Vaill. Afr. 28 (*F. ranivorus*, Sh.).—The *Busard roux*, Vieill. Amer. pl. ix, which this author considers as identical with the *F. hudsonius*, Edw. 107.—The *Busard d'hiver*, (*Circus hyemalis*,) Vieill. Amer. 71, which does not appear to be the *F. hiemalis*, Wils. IV, xxxv, 1.*—The *Busard à croupion blanc* (*Circ. europogistus*,) Vieill. Amer. 8.—Probably, also, the *F. uliginosus*, Edw. 291, belongs to this subgenus, but until the changes of plumage, produced by age, are ascertained, it will be very difficult to determine its species. M. Ch. Bonaparte says that the *F. uliginosus* is a young female of the *cyaneus*.

(3) M. Vieillot has changed these names into Ophiotheres, Gal. pl. 260.

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* Our author here seems to be in error ; the bird figured by Wilson, Vol. IV, pl. xxxv, fig. 1, is the true *Falco hyemalis*, Gm. *Am. Ed.*

Grallatoriæ, or Waders; but its legs completely invested with feathers, its hooked and cleft beak, projecting eye-lids, and all its anatomical details place it in the present order. The tarsus is scutellated, its toes short in proportion, and the circumference of the eye naked; it has a long stiff crest on the occiput, and the two intermediate quills of the tail extend much beyond the others. It inhabits the dry and open grounds in the vicinity of the Cape, where it hunts reptiles on foot; its claws consequently become much worn. Its chief strength lies in the leg. It is the *Falco serpentarius* of Gmel. Enl. 721; Vieill. Galer. 260. The inhabitants of Martinique have endeavoured to multiply the breed, in order to destroy the Lance-headed Viper with which that island is infested.

THE NOCTURNAL BIRDS OF PREY.

Have a large head; great eyes, directed forwards, surrounded by a circle of fringed feathers, the anterior of which cover the cera of the beak, and the posterior, the opening of the ear. Their enormous pupil permits the entrance of so many rays of light, that they are dazzled by that of day. Their cranium, which is thick, but formed of a light substance, is excavated by large sinuses, which communicate with the ear, and which probably assist in strengthening the sense of hearing; but the organs of flight are not very vigorous; their fourchette is weak; their feathers being soft, and covered with a fine down, make no noise in flying. They can direct their external toe either forwards or backwards. These birds are chiefly on the wing during twilight, and when the moon shines. When attacked in the day time, they do not fly off, but stand more erect, assume odd postures, and make the most ludicrous gestures.

Their gizzard is tolerably muscular, although their prey is wholly animal, consisting in mice, small birds, and insects; but it is preceded by a large crop; their cæca are long and wide at bottom, &c. Small birds have a natural antipathy to them, and frequently assemble from all quarters to attack them. They form but one genus,

Strix, Lin.

Which may be divided by their tufts, the size of their ears, the extent

of the circle of feathers which surrounds their eyes, and some other characters.

Those species which have a large and complete disk of fringed feathers round the eyes, itself encircled by a ring or collerette of scaly feathers, between which is a large opening for the ear, are further removed, as to form and habits, from the diurnal birds of prey, than those in which the ear is small, oval, and covered by fringed feathers, which spring from under the eye. Traces of these differences may be seen even on the skeleton. Among the first species we will particularize,

Otus, Cuv.

The Horned Owls, or those which have two tufts of feathers on the forehead, (vulg. *horns*,) which they can erect at pleasure; the conch of whose ear extends in a semicircle from the beak to the top of the head, and is furnished in front with a membranous operculum. Their feet are feathered down to the nails. Such in Europe are the

Str. ascalaphus, Savig. Eg.; Brit. Zool. tab. B, 3. A fourth larger than the common one, and like it, fulvous spotted with brown, and vermiculated on the wings and back; but the belly transversely striped with narrow lines, and the crests or tufts very short. It properly belongs to Africa, but is sometimes seen in Europe.(1)

Str. otus, L.; *Moyen Duc*, Buff.; Frisch, lxxxix; Brit. Zool. tab. B, iv, f. 1; Naum. 45, 1. (The Common Owl.) Fawn coloured, with longitudinal brown spots on the body and underneath; wings and back vermiculated with brown; horns half the length of the head; eight or nine bands on the tail.

Str. ulula and *Str. brachyotos*, Gm.; *Moyen Duc à huppes courtes*, Enl. 438; Frisch, c; Naum. 45, 2; Brit. Zool. tab. B, iv, f. 2; Wils. IV, xxxiii, 3. As to colouring, nearly similar to the preceding; back, not reticulated; narrow longitudinal lines on the belly, and four or five brown bands on the tail. The tufts or horns are only found on the male, and are so small and so seldom erected, that this bird was for a long time left among the species without tufts, and even formed two species. Found almost every where.(2)

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(1) Witness the one represented in Brit. Zool. whose figure has so much embarrassed the naturalists.

(2) Add the *American Owl*, (*Str. mexicana*,) Gm. or *Str. clamator*, Vieill. Am. 20, or *Str. longirostris*, Spix, IX, which only differs from our Common Owl in the greater blackness of the spots.—The *Hibou tacheté du Cap*, (*Str. africana*, T.)

We may reserve the name of

ULULA, Cuv.

Or the Howlers, for those species which have the beak and ears of the Otus, but not the horns. There are none such in France, but they are to be found in the north of both continents, viz.

Str. laponica, Gm. Almost as large as the *Grand Duc* of France; above, grey and brown mixed, whitish; longitudinal brown grey spots beneath. Inhabits the mountains in the north of Sweden.(1)

STRIX, Savigny.

The ear as large as in Otus, furnished with a still larger operculum; but the elongated beak is only curved near the end, while in all the other subgenera it is arcuated from the point. They have no horns; their tarsi are feathered, but they have only hairs on the toes. The mask formed by the fringed feathers, which surround the eyes, has a greater extent, and renders their physiognomy more singular than that of any other nocturnal bird.

The species common in France, *Str. flammea*, L.; Enl. 440; Frisch, lxxxxvii, Naum. 47, 2, appears to be diffused over the whole globe. The back is shaded with a fawn and an ash colour, or brown, prettily picked in with white points, each of which is enclosed by two black ones; the belly is sometimes white, sometimes fawn coloured, with or without brown spots. It builds in steeples, towers, &c., and is particularly considered by the vulgar as a bird of ill omen.(2)

SYRNIUM, Savigny.

The mask and collerette of the preceding; but the conch is reduced to an oval cavity which does not extend to half the height of the cranium; they have no aigrettes, and the feet are feathered down to the nails.

Str. aluco and *stridula*, L.; *Chat-huant*, *Chouette des bois*, &c.;

Col. 56, or *Str. maculosa*, Vieill. Gal. 23.—The *Hibou à gros bec*, (*Str. macrorhynchos*, T.) Col. 62.—The *Hibou à joues blanches*, (*Str. leucotis*, T.) Col. 6.—The *Yellow-cheeked Owl*, (*Str. otus*,) Wils. VI, li, 3, differs from the *Otus* of Europe.—The *Spotted Owl of America*, (*Str. nævia*, Lath.) Wils. III, xix, 1, of which the *Str. asio*, Id. IV, xlii, 1, is probably the young bird, or the female.

(1) Add the *Chouette grise du Canada*, (*Str. nebulosa*, Gm.) Vieill. 17, Wils. IV, xxxiii, 2.

(2) Add *Str. badia*, T. Col. 54.—N. B. The *Chouette à queue fourchue du Brésil*, Col. 432, does not appear to differ from the *Str. flammea*, except in the variation caused by stuffing.

Enl. 441, 437; Frisch, lxxxxiv, lxxxxv, lxxxxvi; Naum. 46 and 47, 1. Somewhat larger than the Common Owl; covered with longitudinal brown spots, transversely denticulated on the sides; white spots on the scapulars, and towards the anterior edge of the wing. The ground of the plumage in the male is greyish, in the female reddish, from which circumstance they were considered for a long time as two species.(1) They build in the woods, frequently lay their eggs in other birds' nests, and keep themselves in the hollows of old trees.(2)

We reserve the name of

BUBO, Cuv.

Or Ducs, for those species, which, with as small a conch as that of the Syrnii, and the disk of feathers less strongly marked, are furnished with tufts. Those which are known have large feet feathered to the nails; such is

Str. bubo; The *Grand Duc* of naturalists; Enl. 434; Frisch, lxxxxiii; Naum. 44. The largest of the nocturnal birds; fawn coloured, with a brown streak, and lateral points on each feather; the brown predominates above; fawn coloured underneath; tufts almost entirely black.(3)

THE TUFTED CHOUETES, Vaill. Afr. xliii,

Are mere Ducs, whose tufts more widely separate, and placed farther back, can scarcely be elevated above a horizontal line. They are found in both hemispheres.(4)

NOCTUA, Savigny.

Neither tufts, nor an open or deeply set conch; opening of the ear oval, and hardly any larger than in other birds; the disk of fringed

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(1) The *Str. sylvestris, rufa, noctua, alba* of Scopoli, and the *Str. soloniensis,* which Gmelin has intercalated in his system, are too undetermined to be considered other than varieties, and probably of the stridula. It is well to know that in the whole of this genus the females are redder than the males—by not attending to this, the species have been improperly multiplied.

(2) Add the *Str. pagodarum,* Tem. Col. 220.

(3) We cannot admit the *Str. scandiaca,* L. whose only foundation is a figure of Rudbeck, probably taken from a variety of the Grand Duc. Add *Str. magellanica,* Enl. 585, from which the *Str. virginiana,* Daud. II, 13, and Wils. Am. VI, l, 1, or *Str. pinicola,* Vieill. Am. 19, only differs in being of a more reddish tint.—*Str. lactea,* T. Col. 4.

(4) *Str. griseata,* Sh.; Vaill. Afr. 43, of Guiana.—*Str. strepitans,* T. Col. 174, and of *Batavia,* 229.

Add *Str. cinerea,* Gm., Bonap. Am. Orn. pl. xxiii, f. 2. *Am. Ed.*

feathers is smaller, and less perfect than in the Bubo, Cuv. Their relations to the diurnal birds of prey are very evident, even in their habits.

Some of them are remarkable for a long, cuneiform tail, and have the toes thickly clothed with feathers; they are the Surnia, Dumer. It appears that there exist in all the North some closely allied species or varieties, but imperfectly distinguished under the names of *Str. funerea*, *hudsonia*, *uralensis*, *accipitrina*, &c.

The best known species, *Str. nisoria*, Wolf.; Enl. 473; Naum. 42. 2, from the north of the whole globe, is about the size of the Sparrowhawk; blackish brown above, with small white spots on the head, which form transverse bars on the scapulars; transversely striped with brown and white beneath, with ten transverse white lines on the tail. It hunts more during the day than the night.

The species from the Uralian mountains, *Str. uralensis*, Pall. Naum. 42, 1, is nearly as large as the *Harfang;* brown, with white spots, above; white, with long brown spots, beneath; five transverse grey bands on the tail. It also hunts during the day, and is sometimes seen in Germany. It is probably the *Hybris* or *Ptynx* of Aristotle, l. ix, c. 12.

The species, called of Acadia, *Str. acadica*, Naum. 43, f. 1 and 2; Wils. Am. IV, xxxiv, 1, is also sometimes found there, but it belongs to the whole north of the globe. It is the smallest of the Ululæ, and is hardly larger than the Common Finch. It does not fear the light of day, but Vaillant has described one of these Surniæ from Africa, (*Choucou,* No. xxxviii,) all white beneath, with fourteen or fifteen lines on the tail, and which, according to his account, is more nocturnal than the other Ululæ.

There are other Noctuæ which have a short tail and feathered toes. The largest, and in fact the largest of all the nocturnal birds without tufts, is

Str. nyctea, L.; *Le Harfang*, Enl. 458; Wils. IV, xxxii, 1; Naum. 41. (The Snowy Owl.) This bird almost equals the Grand Duc in size. Its snow-white plumage is marked with transverse brown spots, which disappear with age. It inhabits the north of both continents, builds upon high rocks, and pursues Hares, Grouse, &c.(1)

There are some smaller species, such as

Str. tengmalmi, Gm.; *Str. dasypus*, Bechst.; Naum. 48, f. 2

(1) The *Chouette blanche*, Vaill. Afric. 45, is only an old Harfang. The alleged difference in the proportions depends upon the stuffing

and 3. Back brown, sprinkled with white spots; underneath paler, with larger white spots; four white lines across the tail; lives in the woods. The *Str. passerina*, Meyer and Wolf, is its female.

The greater number, however, of these small species have only a few scattered hairs on the toes, such as

Str. passerina, Gm.; *Str. pygmæa*, Bechst. Enl. 439; Naum. 48, 1. Somewhat smaller than the preceding, but with nearly the same plumage. The tail a little shorter, and with five larger pale bars: it lives in old walls. There are several closely allied species in America, the Indies, &c.(1)

Some of these naked-toed Noctuæ are nearly as large as the Hulotte. Cayenne produces several beautiful species, and particularly the three following:

Str. cayennensis, Gm.; Enl. 442. A fawn-coloured ground, irregularly, transversely, and finely striped with brown.

Str. lineata. Sh.; the *Huhul*, Vaill. Afr. XLI.; *Str. lineata*, Sh.; *Str. albomarginata*, Spix, X, a. Transversely striped with white on a black ground; four white lines on the tail. So little does it fear the light, that it is styled the Diurnal Chouette. The size of these two species is that of the common Chouette of France.

Str. torquata, Daud.; Vaill. Afr. XLII. Brown above; whitish beneath; circumference of the eyes and a band on the breast, brown. It is larger than the Chat-huant, and is the *Nacurutu without tufts* of Azzara.

There are others again in America, whose tarsi are naked as well as their toes, the *Chevèche nudipède* for instance—*Str. nudipes*, Daud. Vieill. Amer. XVI. Finally, we have

Scops, Savigny,

Which, in addition to the prominent ears, imperfect disk and naked toes of the preceding, have tufts similar to those of a Bubo.

There is one of them in France, *Str. scops*, Enl. 436; Naum. 43, 3, hardly as large as a Thrush, with cinereous plumage, more or less shaded with fawn colour; prettily variegated with little narrow black streaks, and with transverse vermicular grey

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(1) *Str. brama*, T. Col. 68, which scarcely differs from the *passerina*.—*Str. Sonnerati*, Col. I.—*Str. urucurea*, Id. of which the *Str. grallaria*, Id. Col. 136, is the female.—*Str. castanoptera*, Hoff. or *Str. spadicea*, Reinw. Col. 98.—*Str. pumila*, Illig. or *cabouré* of Azz. Col. 39, of which the *Str. passerinoides*, Col. 344, is probably the male.—*Str. ferruginea*, Pr. Max. Col. 199.—*Str. hirsuta*, T. Col. 289.—*Str. occipitalis*.—The *Str. maugei*, Col. 46, is already tolerably large.

lines; a suite of white spots on the scapulars, and six or eight feathers in each tuft; a beautiful little bird.(1)

Certain large species have the legs naked as well as the toes.(2)

ORDER II.

PASSERINÆ.

This order is the most numerous of the whole class. Its character, at first, seems purely negative, for it embraces all birds which are neither swimmers, waders, climbers, rapacious, nor gallinaceous. By comparing them with each other, however, we soon perceive a great mutual similarity of structure, and particularly such insensible transitions from one genus to another, that it is extremely difficult to separate them into subdivisions.

They neither have the violence of the birds of prey, nor the fixed regimen of the gallinaceæ, nor of the water-birds; insects, fruit, and grain constitute their food, which consists the more exclusively of grain, in proportion to the largeness of their beak, and of insects, as it is the more slender. Those which have strong beaks pursue even small birds.

Their stomach is a muscular gizzard. They have, generally, two very small cæca. Among them we find the singing birds, and the most complicated inferior larynx.

The proportional length of their wings, and their power of flight are as various as their habits.

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(1) We can find no difference between the *Str. zorca* of Cetti, the *Str. carniolica* of Scopoli, the *Str. pulchella* of Pallas and the Scops; these gentlemen must have considered their birds as distinct, because Linnæus described the tuft of his as consisting of a single feather. Add the *St. nudipède*, (*Bub. nudipedes*,) Vieill. Amer. 22.—The *Str. atricapilla*, T. Col. 45, or *Str. crucigera*, Spix, IX.—The *Str. noctula*, T. Col. 99.

(2) The *Str. ketupa*, T. Col. 74, and the *Str. Leschenauldi*, Id. Col. 20, will be found at most to form but one species.

The adult sternum usually has but one notch on each side of its lower edge. There are two, however, in Coracias, Alcedo, and Merops, and it is totally wanting in Cypselus and Trochilus.

Our first division is founded upon the feet; we then have recourse to the beak.

The first and most numerous comprehends those genera in which the external toe is united to its fellow by one or two phalanges only.

FAMILY I.

DENTIROSTRES.

In this family the beak is emarginate on the sides of the point. It is in this family that we find the greatest number of insectivorous birds, though almost all of them likewise feed on berries and other soft fruits.

The genera are determined by the general form of the beak, which is strong and compressed in Lanius and in Turdus, depressed in Muscicapa, round and thick in Tanagra, slender and pointed in Motacilla; but the change from one of these forms to the other is so gradual, that it is an extremely difficult matter to fix the limits of the genera.

LANIUS, Lin.

The beak conical or compressed, and more or less hooked at the point.

LANIUS, properly so called.

The true Shrikes have a beak triangular at base, and compressed on the sides.

Shrikes live in families, and fly irregularly and precipitately, uttering shrill cries; they build on trees, lay five or six eggs, and take great care of their young. They have a habit of imitating, on the spot, a part of the songs of such birds as live in their vicinity. The upper part of the females and of the young is marked with fine transverse lines.

Some of them have the upper mandible arcuated; those in which its point is strong and much curved, and in which the notch forms

a small tooth on its sides, are so courageous and cruel, that many naturalists have thereby been induced to place them among the birds of prey. In fact, they pursue small birds, and successfully defend themselves against the larger ones, even attacking the latter when it is necessary to remove them from their nests.(1)

There are four or five species of this subdivision in France.

Lanius excubitor, L.; Enl. 445; Naum. 49. As large as a thrush; ash coloured above; white beneath; wings, tail, and a band around the eye, black; some white on the scapulars, the base of the wing-quills, and on the external edge of the lateral quills of the tail. It remains in France the whole year.

In the south of Europe there is a race, or perhaps a species of a deeper colour, with a vinous tint underneath—*Lan. meridionalis*, Temm. There are others in America still more closely allied to it.(2)

Lan. excubitor minor, Gm.; Enl. 32, 1; *Lan. minor*, Naum. 50. (The Little Shrike.) Somewhat smaller than the Common Shrike, the beak shorter and thicker, wings and tail similar; cinereous above; reddish on the belly; the black bands of the eyes united, on the forehead, in a large bandeau. A very distinct species.

Lan. collurio-rufus, and *Lan. pomeranus*, Gm.; Enl. 9, 2; *Lan. rutilus*, Lath.; *Lan. ruficollis*, Sh.; *Lan. rufus*, Naum. 51. (The Red Shrike.) The bandeau, wings and tail of the preceding; not quite so large; top of the head and neck, a vivid red; back black; the scapulars, belly and rump, white.

Lan. collurio, Gm.; Enl. 31; Naum. 52. (The Butcher Bird.) Still smaller; top of the head and rump ash coloured; back and wings fawn coloured; whitish above; a black band over the eye; wing-quills black edged with fawn colour, those of the tail black, the lateral ones white at base. It destroys small Birds, young Frogs and great numbers of Insects, which it sticks upon the thorns of bushes, in order to devour them at leisure, or to find them again when wanted.

The last three species leave France during the winter.

Other countries have several of these Shrikes with arcuated beaks,

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(1) It is from this first subdivision that M. Vieillot has made his genus *Lanius*, Gal. pl. cxxxv.

(2) *Lan. carolinensis*, Wils., III, xxii, 5, and his *Lan. excubitor*, I, v. 1, which he considers as the same. M. Ch. Bonaparte makes two species of them, and refers them to the *Lan. ludovicianus*, and *Lan. septentrionalis* of Gm.; or to the *Lan. ardesiacus* and *borealis* of Vieillot, Am. 51 and 50; we must confess, however, that there is but little resemblance between these different figures.

the points of which latter diminish, and become weak, according to the species so gradually, that it is impossible to fix a limit between this subgenus and the Thrushes.(1)

There are other Shrikes, whose superior mandible is straight, and only hooked at the tip. Their form passes by insensible gradations to that of the Fauvets and other Motacillæ.(2)

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(1) The species with the strongest beaks are, for instance: the *Cape-Shrike*, (*Lan. collaris*, Gm.); Enl. 477, 1; Vaill. Afric. pl. lxi, lxii.—The *Boubou*, Vaill. 68 (*Lan. boulboul*, Sh.).—The *Brubru*, Vaill. 71 (*Lan. capensis*, Sh.).—La *Petite Pie-gr. de Madag.* (*Lan. madagascariensis*, Gm.) Enl. 299.—La *Petite Pie-gr. bleue* (*Lan. bicolor*, Gm.); Enl. 298.—La *Pie-gr. de la Louisiane*, (*Lan. americanus*,) Enl. 397.—The *Sourciroux*, Vaill. 76, 2, or the *Tangara verderoux* of Buff. (*Tanagra guianensis*, Gm.).—*The Black-Headed Shrike* of the Sandwich Islands, (*Lan. melanocephalus*, Gm.) Lath. Syn. I, 165.—*La Pie-gr. à queue pointue*, (*Lan. pyrrhonotos*,) Vieill. Gal. 135.

The genus Lanio of Vieill. is founded on an arcuate-beaked Shrike; the edges of whose upper mandible are somewhat angular. It is the *Tangara mordoré* of Buff. Enl. 809, 2 (*Lan. atricapilla*, Gm.).

Among those species most nearly allied to the Thrushes, we may admit the *Muscicapa tamnophiloides*, Spix, 26, 1.—*L'Oliva* of Vaill. 75 and 76, 1 (*Lan. olivaceus*, Sh.).—The *Gonolec*, (*Lan. barbarus*, Gm.); Enl. 56, Vaill. 169.—The *Lan. gutturalis*, Daud. Ann. Mus. III, 144, pl. xv; or the *Pie-gr. Perrin.* Vaill. 286.—Le *Merle à plastron noir* (*Turdus zeilonus*, Gm.); Enl. or the *Bacbakiri*, Vaill. 67 (*Lan. bacbakiri*, Sh.).—*La Cravatte blanche*, Vaill. 115 (*Motac. dubia*, Sh.).—The *Turdus crassirostris*, Gm.; Lath. Syn. II, 34, which is the same as the *Tanagra capensis*, Sparm. Carls. pl. xlv, and several others quite as equivocal. It is from this subdivision, with weak bills, that Vieill. has established his genus *Laniarius*, Galer. 143.

His *Vireo* only differs from it in the beak being a little shorter and more slender, *Vir. flavifrons*, Vieill. Am. 54, or *Muscic. sylvicola*, Wils., I, vii, 3.—*V. musicus*, Vieill. 52, or *Music. cantatrix*, Wils. II, xviii, 6, or *Music. noveboracensis*, Gm.—*V. olivaceus*, Ch. Bonap., or *Muscic. oliv.* Wils. II, xii, 3, or *tamnophilus agilis*, Spix, 34, 1.—*V. gilvus*, Ch. Bonap., or *Musc. melodia*, Wils. V, xlii, 2. They lead us almost directly to the true Fauvets.

(2) *Le Blanchot*, Vaill. Afr. 285, (*Lan. icterus*, Cuv.) or *Thamnophilus*, Vieill. Galer 139.—The *Grand battara*, Azz. or *Thamnophilus magnus*, Pr. Max. or *Th. albiventer*, Spix, 32.—The *tchagra*, Vaill. 70, (*Lan. senegalensis*, Spix, *Lan. collurio melanocephalus*, Gm.) Enl. 479, 1 and 279, 1.—The *Fourmillier huppé*, Buff. (*Turdus cirrhatus*, Gm.) The *Pie-gr. à huppe rousse d'Amerique*, (*Lan. canadensis*, Gm.) Enl. 479, 2, is the female.—The *Tachet*, Vaill. 77, (*Lan. punctatus*, Sh.).—The *Pie-gr. rayée de Cayenne* (*Lan. doliatus*) Enl. 297, 2, or *radiatus*, Spix, 35, 2.—The *Pie-gr. bridée*, (*Lan. virgatus*, Tem.) Col. 256, 1.—The *Pie-gr. masquée*, (*Lan. personatus*, Id. or *Lan. nubicus*, Licht.) Col. 256, 2.—The *Thamnophilus lineatus*, Spix, 33.—*Th. strigilatus*, Id. 36, 2.—*Th. melanocceph.* Id. 39, 1.—*Th. leuconotos*, Ib. 2.

The *Pie-gr. rousse de Madag.* (*Lan. rufus*, Gm.) Enl. 298.

It is also among these straight beaked Shrikes that must be placed the *Geai longup.*, Vaill. 42, (*Lan. galericulatus*, Cuv.), but it leads to the Vanga.

In some of these straight-beaked Shrikes, that organ is very stout, and its lower mandible much inflated.(1)

Others, whose beak is straight and slender, are remarkable for vertical tufts of feathers.(2)

Around these Shrikes, properly so called, some other subgenera, which differ from them more or less, form natural groups. Such are the

Vanga, Buff.

Which have a large beak, very much compressed throughout, its tip much hooked, and that of the inferior mandible bent downwards.(3)

Ocypterus, Cuv.(4)

The beak, conical, rounded, without a ridge, slightly arcuated towards the end, with a very fine point slightly notched on each side; the feet rather short, and the wings as long as the tail, and longer; from which circumstance their flight is rendered similar to that of the Swallow; but they have the courage of the Shrikes, and do not fear to attack even the Crow.(5)

Numerous species inhabit the coast and islands of the Indian

I also place here that bird which has been so bandied about by naturalists, the *Merle de Mindanao* of Buff. Enl. 627, *Turdus mindanensis*, Lath and Gm. the same as their *Gracula saularis*, Little Pie of the Indies, or *Dial-bird*, Albin. III, 17 and 18, Edw. 181, Vaill. Afr. 109 (*Sturnus solaris*, Daud.)—and even the *Terat boulan* (*Turdus orientalis*), Enl. 273, II, might be approximated to it, but is also very closely allied to the Turdoides.

The genus Thamnophilus or *Battara* of Vieillot is formed by one of these straight beaked Shrikes, but is so badly determined that other authors have referred to it, Vireos, &c.

(1) *Lanius lineatus*, Leach, Zool. Miscell. pl. vi.—*Thamnophilus guttatus*, Spix, 35.

(2) The *Geoffroy*, Vaill. Afr. 80 and 81, and Vieill. Gal. 142 (*Lan. plumatus*, Sh.), of which Vieill. has made his genus Prionops, or *Bogadais*, Galer. 142 and the *Manicup*. Buff. Enl. 707 (*Pipra albifrons*, Gm.), which has nothing more in common with the Pipra than a somewhat unusual prolongation of the union between the two external toes. Vieill. has made his genus Pithys, Galer. 129, from it.

(3) The *Vanga*, Enl. 228, (*Lan. curvirostris*, Gm.) and new species, such as the *V. destructeur*, Cuv. Col. 273.—The *V. strié huppé*, Voy. de Freyc. pl. xviii and xix, or *Thamnophilus Vigorsii*, Zool. Journ. Supp. VII and VIII.

(4) *Ocypterus* or *oxypterus*—rapid wings, pointed wings—the Greek name of an unknown bird, very applicable to these. It is from this genus that Vieill. has made his Artamus.

(5) Sonnerat, Pr. Voy. p. 56.

Ocean, where they are constantly and rapidly flying about in pursuit of Insects.(1)

Barita, Cuv.(2)—Cassicans, Buff.

A large conical beak, straight and round at base, which scallops out a circular notch in the feathers on the forehead; round back, compressed sides, hooked point, and sloped laterally. The nostrils, small and linear, are not surrounded by a membranous space.

They are large birds of New Holland and its neighbouring islands, which have been arbitrarily placed in several genera. They are said to be very noisy and clamorous. They pursue small Birds.(3)

Chalybæus, Cuv.

A beak similar to that of the Baritæ, but somewhat smaller at base, and the nostrils pierced in a large membranous space. The species known are from New Guinea, and are remarkable for their beautiful tints, which resemble browned steel.

C. paradisæus, Cuv.; *Paradisæa viridis*, Gm.; Enl. 634. The feathers on the head and neck like curled velvet,—which, added to the lustre of its hues, has caused it to be placed among the Birds of Paradise.

C. cornutus, Cuv.; *Barita Keraudrenii*, Less. and Garn. Voy. de Duperr. pl. 13. Two pointed tufts of feathers on the occiput; its trachea forms three circles, before it reaches the lungs.

Psaris, Cuv.(4)—Becardes, Buff.

The beak conical, very stout and round at base, but does not scallop out the feathers on the forehead; the point slightly compressed and hooked. From South America. The best known species is the

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(1) Here come *Lan. leucorhynchos*, Gm. Enl. 9, 1, the same as *Lan. dominicanus*, Sonnerat, Voy. I, pl. xxv.—*Lan. viridis*, Enl. 32, 1.—*Ocyp. cinereus*, Val.—*Ocypterus fuscatus.*—*Ocyp. rufiventer.* Consult the monography of M. Valenciennes on this genus published in the Mém. du Mus. tom. VII, p. 20, pl. 7, 8, 9.

(2) *Barita*, the Greek name of an unknown Bird. M. Viellot has given to my *Baritæ*, the name of Cracticus.

(3) We place here the *Cassican*, Buff. (*Coracias varia*, Gm.; *Gracula varia*, Sh.) Enl. 628.—*Le flûteur*, (*Coracias tibicen*, Lath. second suppl.; *Gracula tibicen*, Sh.) Voy. de Freycin. pl. xx.—*Corvus graculinus*, J. White; *Coracias strepera*, Lath. Ind. Ornith.; *Gracula strepera*, Shaw; *Réveilleur de l'Isle de Norfolk*, Daud.; *Gr. calybé*, Vaill. Ois. de Par. 67; Vieill. Galer. 109, and one species with a tapering tail, *Bar. anaphoresis*, Temm.

(4) *Psaris*, the Greek name of an unknown Bird. Vieill. has changed it into Tityra, Galer. 134, 1; Spix into *Pachyrhynchus*, Av. Brasil, 44.

Lanius cayanus, Gm.; Enl. 304 and 307; Vieill. Galer. 134; Spix, 44, 1. Cinereous; head, wings and tail, black. Its habits are those of the Shrikes.(1)

GRAUCALUS,(2) CUV.—CHOUCARIS, Buff.

The beak less compressed than in the Shrikes; the upper ridge is sharp pointed, and regularly arcuated, the commissure slightly so. The feathers which sometimes cover their nostrils have caused them to be referred to the Ravens, but the emargination of their beak removes them from that genus. From the remotest parts of the Indian Ocean.(3)

BETHYLUS, CUV.(4)

The beak stout, short, arched every where, slightly compressed near the point.

One species only is known, which, as to shape and colour, is a miniature resemblance of the common European Magpie.(5)

FALCUNCULUS, Vieill.

The beak compressed, nearly as high as it is long; the upper ridge arcuated.

The species known,—*Lanius frontatus*, Lath.; Second Suppl. Col. 77; Vieill. Galer. 137, is of the size of the Finch, and

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(1) Buffon has improperly extended the name of *Bécarde*, (PSARIS, C.) to a Tyrannus (*Lan. sulfuratus*), and to a Shrike closely allied to the Thrushes (*Lan. barbarus*). Add *Pachyrhynchus semifasciatus*, Spix, 44, 2, which is the *Psaris Cuvieri*, Swains.—the *Psaris erythrogenis*, Selby, Zool. Jour. I, p. 484.—The *Pachyrhynchus, niger, Cuvieri, cinerascens, rufescens*, Spix, 45 and 46, have a smaller beak but the same form.

(2) *Graucalus*, the Greek name of an ash-coloured Bird; three out of four of these being of this colour. Vieillot confounds them with his CORACINA, which comprize the *Gymnoderus* and *Gymnocephalus*, of which we shall speak hereafter.

(3) *Corvus papuensis*, Gm.; Enl. 630; Vieill. Galer. 113.—*Corvus novæ Guineæ*, Enl. 629.—*Corvus melanops*, Lath.—*Rollier à masque noir*, Vaill., Ois. de Par., &c. 86.—Another, entirely of a brilliant violet of browned steel, the female greenish, which forms the genus PIROLL of Temm., or PTILONORHYNCHUS of Kuhl, founded on the head feathers being more like velvet. The genus SPHECOTHERE of Vieill., Galer. 147, *Choucari vert* of the Voy. du Freycinet, pl. xxi, only differs from the others in being a little more naked about the eye.

(4) *Bethylus*, the Greek name of an unknown Bird: Vieillot has changed it into that of *Pillurion* or CISSOPIS.

(5) It is the *Pie-grièche*, Vaill. Afr. 60, and Vieill. Galer, 140. *Lanius leverianus*, Sh. *Lanius picatus*, Lath. Illiger makes a Tangara of it. We may approximate to it the *Lan. corvinus*, Sh.; Vaill. Afr. 78, the beak of which, however, is more compressed.

coloured nearly like the *Parus major*. The feathers on the head of the male form a tuft. From New Holland.

Pardalotus, Vieill.

The beak short, but slightly compressed; upper ridge sharp-pointed, and arcuated; the point emarginate. Very small Birds, with a short tail.

The best known species, *Pipra punctata*, Sh. Zool. Misc. III; Col. 78; Vieill. Gal. pl. 73, is partly sprinkled with white. From New Holland.(1)

Muscicapa, Lin.

The Fly-Catchers have a horizontally depressed beak, furnished with hairs at its base, and the point more or less hooked and emarginated. Their general habits are those of the Shrikes, and they live on small Birds or Insects, according to their size. The weakest of them gradually approach the form of the Wagtails. We divide them as follows:

Tyrannus, Cuv.(2)

The Tyrants have a very stout, long, straight beak; the upper ridge blunt; the point curved suddenly into a hook. They are American Birds, as large as the European Shrikes, and equally courageous. They defend their young even from the Eagle, and drive all Birds of prey from their nest. The larger species feed on small Birds, and do not always despise carrion.(3)

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(1) Add *Pardal. ornatus*, Temm., Col. 394, 1.—*P. percussus*, Id. 394, 2. They lead us to the first subdivision of the Tanaers.

(2) Vieillot has adopted this name and genus, Galer. 133.

(3) The *bentaveo*, or Spoon-billed Tyrant of Brazil, Enl. 212 (*Lanius pitangua*, Gm.).—*Le Tyran à ventre jaune*, (*Lan. sulfuraceus*, Gm.) Enl. 296, the same as the *Garlu* or *Geai à ventre jaune de Cayenne*, (*Corvus flavus*, Gm.) Enl. 249.—The *Musc. velata*, Spix, 22.—*Musc. polyglotta*, Id., 24.—*Musc. similis*, Id., 25, of which his *Musc. rufina*, Ib. 131, is the young.—The *Musc. cinerea*, Spix, 26, 2.—Le *Tyran à ventre blanc*, (*Lan. tyrannus*, Gm.) Enl. 537 and 676, Vieill. Galer. 133.—*Musc. cinerascens*, Spix, 22.—Le *Tyran à queue rousse*, (*Musc. audax*, Gm.) Enl. 453, 2; Wils. Am. II, xiii, 1.—*Le Petit tyran*, (*Musc. ferox*, Gm.), Enl. 571, 1, or *Musc. furcata*, Spix, 19. The *Musc. vetula*, Spix, 18.—*Le Tyran à queue fourchue de Cayenne*, (*Musc. tyrannus*, Gm.), Enl. 471, 2.—*Le F. à q. f. du Mexique*, (*Musc. forficata*, Gm.) Enl. 677. The *Fork-Tailed Tyrant of Brazil*, (*Musc. longicauda*, Spix, 17) Zool. Journ. II, pl. iv.—*Le Tyran à huppe verte* (*Musc. crinita*, Gm.) Enl. 569; Wils. Am. II, xiii, 2?

Add also *Musc. verticalis*, Am. Orn. Bonap. I, pl. ii, f. 2. *Am. Ed.*

Muscipeta, Cuv.

The beak long, much compressed, double its height in breadth, even at its base; the ridge very obtuse, sometimes however very acute; the edges slightly curved; the point and emargination weak; long setæ or mustachios at its base.

They are too powerless to capture any thing but Insects, and several of them are ornamented with long tail feathers, beautiful crests on the head, or at least with brilliant colours. The greater number inhabit Africa and the Indies.(1)

Some species allied to the Muscipetæ, (Platyrhynchus,) are distinguished by a still broader and more depressed beak.(2)

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(1) We should first of all distinguish the *Roi des Gobe-mouches*, Buff. (*Todus regius*, Gm.) Enl. 289. Then we have the crested species, and which have long feathers in the tail, such as the *Moucherolle de paradis* (*Musc. paradisi* and *Todus paradisiacus*, Gm.), Enl. 234. N.B. All these figures represent females; the tail of the males is much longer.—Le *Petit Moucherolle de Paradis* or *Schet* of Madagascar (*Musc. mutata*). Two birds which Buffon describes elsewhere under the name of *Vardiole* or *Pie de paradis*.—Then follow those species without crests, whose tail feathers are somewhat elongated; The *Moucher, Yetapa* (*Musc. psalura*, T.), Col. 286 and 296, or *Musc. risora*, Vieill. 131; the *Moucher à queue de coq; Gallita* of Azz.; *Musc. alector*, P. Max.; Col. 155, Vieill. 132.—*Plathyrh. filicauda*, Spix, 14.

Some species are distinguished by a membranous circle round the eye : *Musc. melanoptera*, Gm.; Enl. 567, 3.—*M. telescophtalma*, Less. and Garn., Voy. de Duperr., Zool., pl. xviii.

Others are remarkable for a long, flat, and obtuse beak, similar to that of the Todies, but it has a notch which is wanting in the true Todies, whose feet also are differently formed. *T. cinereus*, Desmar. or *T. melanocephalus*, Spix, ix, 2. The young is, *T. cinereus*, Spix, x, 1 and *T. maculatus*, Desm.—*T. griseus*, Desm.

Finally, a multitude of other species, as the *mantelé*, Vaill. 151 or *Musc. borbonica*, Enl. 573, 1.—*M. cristata*, 573, 2, and *Tchitrec*, Vaill., Afr., III, 142, 1.—*Musc. cærulea*, Enl. 666, 1.—*Todus leucocephalus*, Pall., Sp., VI, pl. iii, f. 2, or *Musc. dominicana*, Spix, 29, 2. *M. albiventer*, Id. 30, is its female.—*T. sylvia*, Desm.—*Platyrhinchus chrysoceps*, Spix, XI, 2.—*Plat. ruficauda*, Ib. 1.—*Plat. hirundinaceus*, Spix, 13, 1.—*Plat. cinereus*, Ib. 2.—*Musc. barbata*, Enl. 830, 1, of which *M. xanthopygus*, Spix, IX, 1, appears to be the female.—*Musc. coronata*, Enl. 675.—The *molenar*, Vaill. 160, 1, 2, or *M. pistrinaria*, Vieill.—The *G. m. à lunettes*, Ib. 152, 1.—*M. flammiceps*, Tem. Col. 144, 3.—*M. mystax*, Spix, 31.—*M. murantia*, Enl. 331, 1.—*M. querula*, Vieill. Am. 39, from which the *Plat. cinereus*, Spix, XIII, scarcely differs.—*M. cucullata*, Lath., &c.

N.B. The *Mus. barbata* has become the genus Tyrannula, Swainson; and the *M. querula* the Myiagra of Vigors and Horsfield.

(2) It is from this division that M. Vieillot has made his genus *Platyrhynchos*, Gal. 126. Such are *Musc. aurantia*, Enl. 831, 1.—*Todus macrorhynchos*, Lath. Syn. I, pl. xxx, or *Todus rostratus*, Lath., Desmar. and particularly *Todus platyrhynchos*, Pall., Spic., VI, pl. iii, c. We see that many of the Muscipetæ have

Others, whose beak is also broad and depressed, are remarkable for their long legs and short tail. Two or three only are known, all from America; they feed on Ants, which caused them to be united to the little tribe of Thrushes called Ant-catchers, Myotheræ of Illiger.(1)

Muscicapa, Cuv.

The Flycatchers, properly so called, have shorter mustachios and a narrower beak than the Muscipetæ; it is still, however, depressed with an acute ridge above, straight edges, and a slightly hooked point.

Two species of this subgenus are found in France during the summer, and lead a melancholy life on high trees. The most common is,

M. grisola, Gm. Enl. 565, 1. (The Grey Fly-catcher.) Grey above, whitish underneath, with a few greyish spots on the breast. In some countries it is kept in houses to destroy flies. The other,

M. albicollis, Tem.; *Gobe-mouche à collier*, Enl. 563, 2 and 3; and better, Hist. des Ois. tom. IV in 4to, pl. 25, f. 2, the male in wedding plumage; Naum. 65, in its different states. (The Collared Flycatcher.) Very remarkable for the changes of the male's plumage. Similar in winter to the female; that is, grey, with a white band on the wing. In the nuptial season it becomes agreeably variegated, with pure black and white; calotte, back, wings and tail, black; the forehead, collar, and all the upper part of the body, a large spot on the wing, a smaller one in front, and the external edge of the tail, white. It builds on the trunks of trees.(2)

A species subject to the same changes has lately been disco-

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been placed among the Todies, and although Pallas has set us the example of doing so, the notch in the beak, and the separation of the external toe forbid it. Add, *Plat. olivaceus*, T. Col. XII, 1, or *sulfurescens*, Spix, XII.—*Plat. cancromus*, Id. Ib. 2.

(1) Here come *Turdus auritus*, Gm., Enl. 822, and Vieill. Gal. 127, the same as *Pipra leucotis*, but which is neither a Thrush nor a Pipra.—*Pipra nævia*, Enl. 823, f. 2. It is upon this distinction that Vieill. has founded his genus Conopophaga, Galer. 127.

(2) The ancients knew this bird by the names of *Sycalis* and *Ficedula*, in its ordinary plumage, and by that of *Melancorhynchos* and *Atricapilla*, in its wedding livery; but as the name of Bec-figue (*Becca-fico*), is given in the south, and in Italy, to various species of *Fauvet* and *Anthus*, naturalists have applied the united attributes of these birds to a certain state of this Flycatcher, and formed the imaginary species presented by this same name of Bec-figue in Buffon, and in those who have

vered; the neck of the male, however, in the nuptial season, being as black as the back, and wanting the little white spot on the edge of the wing. It is the

M. luctuosa, Tem.; Naum. 64; Edw. 30, 1; The female, Enl. 668, 1. Which is found farther north than the preceding.

A small reddish species has lately been discovered in Germany. *M. parva*, Bechst.; Naum. 65, 3.

The beak of the Flycatchers becomes more and more slender, and finally approaches that of several species of Regulus.(1)

Some species in which the ridge is somewhat higher, and arched towards the point, lead to the forms of the Saxicolæ.(2)

Various genera or subgenera of birds are closely allied to certain links in the series of Flycatchers, although they greatly exceed them in size, viz.

Gymnocephalus, Geoff.

Or the Bald Tyrants. They have a beak similar to that of the Tyrants, except that its ridge is somewhat more arcuated; a great part of their face is destitute of feathers.

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followed him. It is very certainly the *M. albicollis*, and not the *M. luctuosa*, that is the *Becca-fico* of Aldrovandus, Ornith. II, 758 and 759.

(1) We also refer to the true Flycatchers, the *Gillit* (*Muse. bicolor*), Enl. 675, 1. —*Le Pririt*, Vaill. 161; Enl. 567, 1 and 2 (*M. senegalensis*, Gm.).—*M. albicapilla*, Vieill. Am. 37.—*M. armillata*, Ib. 4, 2.—*M. diops*, Tem., 144, 1.—*M. eximia*, Ib. 2.—*M. ventralis*, Id. Col. 275, 2.—*M. virescens*, Ib. 3.—*M. obsoleta*, Ib. 1. *M. flabellifera*, Ib., Gmel. Lath. Syn. II, part I, pl. 49.—*M. scrita*, Vaill. Afr. 154.—*M. ruticilla*, Gm. Enl. 556: Vieill. Am. 35 and 36; Wils. I, vi, 6.—*Platyr. paganus*, Spix.—*Pl. marinus*, Id. 2.—*Pipra elata*, Id. VIII, 2. *See App. XIV. of Am. Edit.*

(2) Such are the *Oranor*, Vaill. IV, 155, and several neighbouring species, similar to the *Muse. ruticilla*, so far as regards the distribution of colours, but differing in the beak, such as *Muse. miniata*, Tem. or *Turdus speciosus*, Lath. Col. 156. —*M. flammea*, Forst. Zool. Ind. 25 and Tem. Col. 263, or *Parus malabaricus*, Lath. —*M. hyacinthina*, Col. 30.—The *Azuroux* (*M. azurea*), Vaill. Afr. 158, 2.—*M. nigerrima*, Vieill. Diet. Spix, 18, 1.—*M. galeata*, Spix, 17, a different species.—*M. stellata*, Vieill., Vaill. 157, 2. *M. longipes*, or the *Miro-Miro* of New Zealand, Less. and Garn. Voy. de Duper. Zool. pl. 19, 1. *M. chrysomelas*, Ib. pl. 18.—*M. nivea*, Spix, 29, 1. *M. icterophis*, Vieill., Diet.—*M. mirundinacea*, Tem. Col. 119.—The *Muse. multicolor*, Gm. Lath. Syn. 2, is so intermediate between the Flycatchers and the *Mot. phœnicurus*, that we hesitate to assign its position.

The species of this type which have the strongest beaks appear to constitute the Drimophiles of M. Temminck.

N.B. The *Mus flabellifera* has become the genus Ripidura of Vig. and Horsf. and the *M. ruticilla*, the Setophaga of Swainson. The *M. sternura*, T. Col. 167, 3, is the Sternura of Swains.: and the species whose head is enlarged by feathers, such as the *M. australis*, White, p. 239, his genus, Pachycephala. The neighbouring genus, Seisura, is formed from the *Turdus volitans*, Lath.

One species only is known, which is the size of a rook, and the colour of Spanish snuff. From Cayenne.(1)

Cephalopterus, Geoff.

In this subgenus, on the contrary, the base of the beak is furnished with feathers which open at top, and form a large panache resembling a parasol.

One species only is known; it is as large as a Jay, and black; the feathers at the bottom of the breast form a sort of pendent dewlap. From the banks of the Amazon; *Cephalopterus ornatus*, Geoff., Ann. du Mus. XIII, pl. xv; *Coracina cephaloptera*, Vieill. Galer. 114; Temm. Col. 255; *Corac. ornata*, Spix, LIX. *See App. XV of Am. Ed.*

Ampelis, Lin.

The Crown-Birds have the depressed beak of the Flycatchers, but it is somewhat shorter in proportion, tolerably broad and slightly arcuated.

Those in which it is the most pointed and strong, have still a decidedly insectivorous regimen: they are called Piauhau from their note—the Querula, Vieill. They inhabit America, where they pursue Insects, in flocks.(2)

The Common Crown-Birds,

Whose beak is rather weaker, besides insects, feed on berries and tender fruits. They inhabit the low grounds of America, the males being remarkable, at the nuptial season, for the brilliancy of their purple and azure plumage. During the rest of the year both sexes are grey or brown.

A. carnifex, L.; *L'Ouette*, Enl. 378; Spix, V. The calotte, rump and belly scarlet; the rest brownish red; fourth quill of the wing narrowed, shortened and tough, or something like horn.

A. pompadora, L.; *Le Pompadour*, Enl. 279. A fine light purple; wing-quills white; the barbs of the great coverts are

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(1) It is the *Choucas chauve*, Buff., Enl. 521 (*Corvus calvus*, Gm.), the *Oiseau mon père* of the negroes of Cayenne, Vaill., Ois. d'Am. et des Indes, pl. xxix.

(2) Here comes the *Common Piauhau;* black, with a purple throat, (*Musc. rubricollis*, Gm.) Enl. 381; Vieill. Gal. 115, and the *Great Piauhau* entirely purple (*Cotinga rouge*, Vail., Ois. d'Afr. et des Indes, pl. xxv, and xxvi, *Coracias militaris*, Shaw). La *Cotinga gris* (*Amp. cinerea*), Enl. 699, is more nearly allied to the *Piauhaus* than the common Crown-birds.

The *Piauhau à gorge aurore* (*Coracias scutata*, Lath. or *Coracina scutata*, T.), Col. 40, has a narrower beak, and approaches more to Cephalopterus.

stiff and arranged on two planes in an acute angle like a roof.

A. cotinga, L.; *Le Cordon bleu*, Enl. 186 and 188. Of the most beautiful ultramarine, with a violet breast, frequently traversed by a large blue band and spotted with dark yellow.(1)

Tersina, Vieill.

This subgenus consists of Crown-Birds whose beaks are a little wider at base.(2)

Ceblepyris, Cuv.(3)

Has, in addition to the beak of the Crown-Birds, a singular character which consists in the somewhat prolonged, stiff and spiny stems of their rump feathers. They are found in India and Africa, where they feed upon caterpillars which they collect upon the highest trees, but they have nothing of the lustre of the true Crown-Birds. Their tail somewhat forked in the middle is sloped on the sides.(4)

We may also separate from them,

Bombycilla, Briss.

The Chatterers, in which the head is ornamented with a toupet of feathers somewhat longer than the rest, possessing moreover another singular character in the secondary quills of the wing, the ends of the stems being enlarged into an oval, smooth, and red disk. There is one in Europe, named, we know not why,

A. garrulus, L. Enl. 261. (The Bohemian Chatterer.) Somewhat larger than a finch; plumage of a vinous grey; throat black; tail black, edged with yellow at the tip; wings black, variegated with white. This bird visits Europe in flocks, at long intervals, and without regularity, from which circumstance, its presence, for a long time, was considered as an evil omen. It is very stupid, is easily captured and brought up; eats of every thing, and a great quantity. Its habitat is thought to be the extreme North. The flesh is esteemed a great delicacy.

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(1) Add *A. cayana*, Enl. 624.—*A. maynana*, Enl. 299.—*A. cucullata*, t., Col. 363, Swains. Zool. Ill. 37.—*A. caprea*, Merremic. Av., 1, 2, appears to be a variety of the carnifex.

(2) *A. tersa*, Gm., *La Tersine*, Buff., Vieill., 119 or *Procné tersine*, Tem., Col. 5, or *Procnias hirundinacea*, Swains. Zool. Ill. III, 21.

(3) The Greek name of an unknown bird. Vieillot has since given to this genus the name of *Campephaga*.

(4) Such are the *Musc. cana*, Gm., Enl. 541, or the *Echenilleur cendré*, Vaill. Afr., pl. clxii, Vieill., Galer. 130; the *Echenilleur noir*, Vaill. lxiv. His *Ech. jaune* is the young of the *Turdus phœnicopterus*, Tem. Col. 71.—Add *Cebl. fimbriatus*, Tem , Col. 249, 250.

There is another species in America extremely similar, but rather smaller, *Ampelis garrulus*, b, Lin.; *Amp. Americana*, Wils. I, vii, 1; *Bombycilla carolinensis*, Wils.; *Bomb. cedrorum*, Vieill., Gal. 118; Vaill., Ois. de Par., I, pl. 50.

There is also one in Japan, *B. phœnicoptera*, Tem.; Col. 450, which has no appendages to the wings, and the tips of whose tail and little wing-coverts are red.

Hofmansegg and Illiger, with equal propriety, separate from the Crown-Birds,

PROCNIAS, Hofman.

The commissure of whose beak, which is weaker and more depressed, extends under the eye. They inhabit America and feed on Insects.

We may subdivide them still more.

The PROCNIAS, properly so called, have the throat furnished with feathers.

One species, *Ampelis carunculata*, Gm., Enl. 793, is distinguished by a long, soft caruncle on the base of the beak. In the perfect state it is white, at other times greenish.

The AVERANOS (CASMARHYNCHOS, Tem.) are Procniæ with a naked throat.

In one species, the naked portion of the male's throat is covered with fleshy caruncles. It is the *Averano* of Buff. IV, p. 457; *Amp. variegata*, Lin.; Col. 51.

Another, *Procn. araponga*, Pr. Max. Col. 368, and 383, or *Casmar ecarunculatus*, Spix, 4, only has some very small, thinly scattered feathers in that place. These birds are white in their perfect state; the young male and the female are greenish.

Finally, directly after the Crown-Birds, should come

GYMNODERUS, Geoff.

Where the beak is but very little stronger; but the neck is partly naked, and the head covered with velvet feathers. The species known is also from South America. It is mostly frugivorous, is of the size of a Pigeon, black, with bluish wings; it is the *Gracula nudicollis*, Sh.; the *Corvus nudus* and the *Gracula fœtida*, Gm. Enl. 609.(1)

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(1) The species of Vaill., Ois. de l'Ameriq. et des Indes, pl. xlv, and xlvi, is perhaps different.

N.B. Vieillot unites *Graculus*, *Gymnoderus* and *Cephalopterus*, in his genus CORACINA.

Edolius, Cuv.(1)

Belongs also to the great series of the Flycatchers; the beak is depressed and emarginate at the end; its upper ridge is acute; but what distinguishes it is, that both mandibles are slightly arcuated throughout their length; the nostrils are covered with feathers, and there are, besides, long hairs forming mustachios.

The species are numerous in the countries bordering on the Indian Ocean. They are generally of a black hue, have a forked tail, and live on insects; some of them, it is said, sing as sweetly as the Nightingale.(2)

Phibalura, Vieill.

The ridge of the beak arcuated as in Edolius, but the beak itself is one half shorter than the head.

The species known, (*Ph. flavirostris,*) Vieill. Gal. 74; Tem. Col. 118; *Ph. cristata*, Goains. Zool. Ill. pl. 31, is from Brazil. The tail is much forked; the plumage is spotted with black and yellow; the feathers of the head with red, recalling to our minds certain Tyrants and Flycatchers.

Tanagra, Lin.

The Tanagers have a conical beak, triangular at base, slightly arcuated at its ridge, emarginate near the end; wings and flight short. They resemble the Finches in habits, and feed on grain as well as on berries and insects. The greater number are remarkable for their bright colours. We subdivide them as follows.(3)

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(1) Vieillot has preferred the name of Dicrurus.

(2) Species. *Lanius forficatus*, Gm., Enl. 189, Vaill. Afr. IV, 166 and Vieill. Gal. 141.—*Lanius malabaricus*, Shaw, Vaill. IV, 175, Sonnerat, Voy. aux Indes et a la Chine, pl. xcvii, which is also the *Cuculus paradiseus*, Briss. IV, pl. xiv, A. 1. —*Lanius cærulescens*, Gm., Edw. pl. xlvi, Vaill. Afr., IV, 172.—*Corvus balicassius*, Gm., Enl. 603.—The *Drongolon*, Vaill. IV, 171.—The *Drongo bronzé*, Id. 176, and several new species.

N. B. The *Bec-de-fer*, Vaill. Afric., 79, from which Illiger has made his genus *Sparactes*, and which is copied, Vieill. Gal., pl. cxxxi, having been examined by Temminck, is found to be a Pogonias, to which other feet had been added, together with a crest. This was done by a dealer, in joke, to impose upon the late M. Raie de Breukelewaerd, a rich Dutch amateur.

(3) For *this* genus and those of *Pipra* and *Todus*, see the work of M. Desmarest and of Pauline de Courcelles, now Madame Knip.

Bullfinch Tanagers.

A short beak, when viewed vertically, showing an enlargement on each side of its base; the tail proportionably shorter.(1)

Grossbeak Tanagers.

The beak conical, thick, convex, as broad as it is high, the back of the upper mandible rounded.(2)

Tanagers, properly so called.

A conical beak, shorter than the head, as broad as it is high, the upper mandible arcuated, somewhat pointed.(3)

Oriole Tanagers.

The beak conical, arcuated, pointed and notched at the end.(4)

Cardinal Tanagers.

Beak conical, somewhat vaulted, an obtuse salient tooth on the side.(5)

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(1) *Tanag. violacea*, Enl. 114, 1, 2—*T. cayennensis*, Ib. 3—*Pipra musica*, Enl. 809, 1—*Tan. diademata*, Natterer, Col. 243 or *Lindo bleu*, Azz., or *Bouvreuil azuré*, Vieill. Gal. 54—The *Lindo bleu doré*, Azz. (*Tan. chrysogaster*, Cuv.)—*Tan. viridis*, Vieill. Col. 36, 3.

(2) *Tan. magna*, Enl. 205.—*Tan. atra*, Enl. 714, 2.—*Coracias cayennensis*, Enl. 616.—*Tan. flammiceps*, Pr. Max. Col. 177.—*Tan. superciliosa*, Spix, 57, 1.—*Tan. psittacina*, Ib. 2.—*Tan. atricollis*, Id. 56, 2. It is on this division that Vieillot has founded his genus Habia.

(3) *Tan. talao*, Enl. 127, 2.—*tricolor*, Enl. 33.—*mexicana*, 290, 2 and 155, 1.—*gyrola*, Enl. 201, 2, and 290, 1.—*episcopus*, Enl. 178.—*cœlestis*, Spix, 55, 1.—*varia*, Desm. (*Motacilla velia*, L.) Enl. 669, 3, of which the *T. Schrankii*, Spix, 51, is probably the young.—*T. punctata* and *siaca*, Enl. 133, L.—*T. multicolor*, Vieill. Gal. 76, or *Fring. zena*, L. Catesby, I, 42.—*T. thoracica*, Tem. Col. 42, 1.—*T. citrinella*, Ib. 2.—*T. vittata*, Ib. 48.—*T. penicillata*, Spix, 49.—*T. auricapilla*, Id. 52.—*T. vittata*, T. Col. 48.—*T. leucoptera*, or *Oriolus leucoperus*, Lath. Syn.

(4) The *T. gularis*, Enl. 156; *pileata*, 720, 2, and *speculifera*, Spix, 36, 1, approach the *Motacillæ* in their more slender beak. *T. nigricollis*, 720, 1, is a true motacilla, a sort of Regulus with a rather large beak.

(5) *T. cristata*, Enl. 7, 2 and 301, 2, of which the *T. brunnea*, Spix, 49, 2, is the young.—*nigerrima*, Enl. 179, 2 and 711.—*olivacea*.—*archiepiscopus*, Desm. Spix, 56, 2.—*Tan. rufiventer*, Spix, 50, 1.—*rufigularis*, Id., 56, 5.—*Saira*, Id. 48, 1.—*viridis*, Ib. 2. This division has been named Tachyphonus, by Vieillot, Gal. 82.

But we should also refer to it, his genus Pyranga, which is solely founded on an individual deformity. We will name his species *Tan. cyanictera*.

The *Palmiste*, Buff. Enl. 509, 1 (*Turd. palmarum*, Gm.), Vieill. Am. II, 69, also belongs to it; its notch is scarcely sensible, and it almost wholly disappears in a neighbouring species, of which Vieillot has made his genus Icteria, *Ict. dumicola*,

RAMPHOCELINE TANAGERS.(1)

A conical beak, the branches of whose lower mandible are enlarged behind.(2)

TURDUS, Lin.

The Thrushes have a compressed and arcuated beak, but its point is not hooked, and its emarginations do not form such deep notches as in the Shrikes; as we have already stated, however, there are gradual transitions from one genus to the other.

Their regimen is more frugivorous, generally feeding on berries. Their habits are solitary.

The term Thrush is more particularly reserved for those species in which the colours are uniform, or are distributed in large masses. The most widely disseminated is,

T. merula, L., Naum. 71. (The European Blackbird.) The male, (Enl. 2,) is entirely black, with a yellow beak; the female, (Enl. 555,) is brown above; reddish brown beneath; the breast spotted with brown. It is a very mistrustful bird, but is easily tamed, and can be taught to sing well, and even to speak. It remains in Europe during the whole year.

A neighbouring species, which, however, is a bird of passage, and prefers the mountains, is,

T. torquatus, L.; *Le Merle à plastron blanc;* Enl. 168 and 182; Naum. 70. (The Ring Ouzel.) Feathers, black, partly edged with white; the breast marked with a shield of the same colour.

The high mountains in the south of Europe contain two species, the *T. saxatilis*, L.; Enl. 562; Naum. 73, and the *T. cyaneus*, L.; Enl. 250; Naum. 72, from which the *T. solitarius*, L. does not differ.(3) The first, which is most frequently found

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Vieill., Am. and Gal., pl. lxxxv, or *Pipra polyglotta*, Wils., I, vi, 2. This species leads to Ploceus. *Tunagra mississipiensis*, Enl. 742, or *T. æstiva*, Wils. Am. VI, 3, 4.—*T. rubra*, 156, 1.—*T. ludoviciana*, Wils., Ill. xx, 1.

N.B. Swainson separates the *T. tatao* and some others from the Tanagers under the name of AGLAIA, and makes a genus of my Tanagers a bec fin, called SPERMAGRA.

(1) From this Vieill. has made his JACAPA, or RAMPHOCELES, Galer. 79.

(2) *Tanagra jacapa*, Enl. 128.—*T. brasilia*, Enl. 127, 1.—*T. nigrogularis*, Spix, 47.

N.B. The *Tanagra atricapilla*, 809, 2 and the *guyannensis* are Shrikes. The *T. cristatella*, Spix, or *Fringilla cristata*, Gmel., *T. graminea* and *T. ruficollis*, Spix, are Buntings.

(3) Obs. Bonnelli.

in the North, is the best known; it nestles on inaccessible cliffs, in ruins, and sings well. The head and neck of the male are of a blue ash colour, the back brown, rump white; beneath, and the tail, orange.(1)

The name of *Grives* is given, in France, to those species, whose plumage is what is termed in that country *grivelé*, that is to say, marked with small black or brown spots. There are four of them in Europe, all with brown backs, and spotted breasts; they are singing birds, which live on insects and berries, migrate in large flocks, and whose flesh is an agreeable food.

T. viscivorus, L.; *La Drenne.* (The Missle Thrush.) Enl. 489; Frisch, xxv; Naum. 66, 1. Is the largest; the underpart of its wings is white; it is extremely fond of the misletoe, and contributes to the dissemination of that parasitical plant.

T. pilaris, L.; *La Litorne*, Enl. 490; Frisch, xxvi; Naum. 67, 2. Which is chiefly distinguished from the Viscivorus by the ash colour on the top of its head and neck.

T. musicus, L.; *La Grive*, properly so called, Enl. 406; Frisch, xxvii; Naum. 66, 2. Underpart of the wings yellow; the best songster of the four, and the one most commonly eaten.

T. iliacus, L.; *Le Mauvis*, Enl. 51, Frisch. xxviii; Naum. 67, 1. (The Mavis.) The smallest of the whole number; under part of the wings and flanks, red.(2)

The species of the genus Thrush, foreign to Europe, are very numerous. We will particularly notice

T. polyglottus, L.; Catesb. xxvi. (The Mocking-Bird.) From North America; ash coloured above, paler beneath, with a white band on the wing. It is celebrated for the astonishing facility with which it imitates the notes of other birds, and even all kinds of sounds.(3)

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(1) It is possible, as is observed by Shaw, that it was by confounding it with the Siberian Jay, that Linnæus attributed to it the habits of a Harpy, and at one time calls it *Corvus*, and at another, *Lanius infaustus*.

We may approximate to the *saxatilis* the *Rocar*, Vaill. Afr. 101 and 102;—the *Espionneur*, Id. 103.

The other species, allied to the Solitary Thrushes by their speckled plumage, are *Turdus manillensis*, Enl. 636; probably the same as *T. violaceus*, Sonnerat, 2d Voy. pl. cviii;—*T. eremita*, Enl. 339;—*T. varius*, Horsf.;—*Myiothera Andromedæ*, Tem. Col. 392.

(2) Two additional species have been taken, though very rarely, in Germany; the *Thrush, with the back and flank spotted with red* (*T. Naumanni*), Naum. 68, and that *with a black breast and throat* (*T. Bechsteinii*), Naum. 69.

(3) *The Little Mocking-bird*, (*T. orpheus*), Edw., 78; *Le Moqueur de St Domingue*, (*T. dominicus*), Enl. 558, 1, are very closely allied to it, as well as the *T. gilvus*, Vieill. Am. 68.

Some of these birds appear to approach the Shrikes, in habits, although there is nothing in the form of their beak which can distinguish them from other Thrushes.(1)

There are no sensible characters by which we can distinguish certain African Thrushes, which live in flocks, are extremely clamorous, feed on insects, and do much mischief in gardens. Several of them are remarkable for the brilliant tints of their plumage, which is of a browned steel colour,(2) and one of the former, by its cuneiform tail, which is one-third longer than the body.(3)

Add, of species foreign to Europe, with the breast or under part of the body spotted; *T. rufus*, Gm., Enl. 645, and Vieill. Am. 59;—*T. fuscatus*, Vieill. Am. 57, bis;—*T. minor*, Gm. or *T. mustelinus*, Wils., or *Gr. tanneé*, or *Gr. solitaire*, Vieill. Am. 62 and 63; *T. interpres*, Kuhl., Col. 458.

With the throat only spotted, at least in the adult, *T. migratorius*, L. Enl. 556; Catesb. 29; Vieill. Am. 60, 61;—*T. ocrocephalus*, Col. 136;—*T. plumbeus*, Enl. 560, Vieill. Am. 58;—*T. Falclandiæ*, T.;—*T. olivaceus*, Gm.;—the *grivron*, Vaill. Afr. 98;—*T. campestris*, Pr. Max.

With the flanks only spotted, *T. punctatus*, Sh. Zool. N. Holl. I, pl. ix, which is the genus Cinclosoma, Vig. and Horsf., Lin. Trans. XV, p. 219.

Of those not spotted underneath, *T. brasiliensis*, Lath.;—*T. perspicillatus*;—*T. melanotis*, or *Reclameur* of Vaill. or *T. vociferans*, Zool. Ill. 179;—*T. nævius*, Vieill. Am. 66;—*T. lividus*, or *Catbird* of Wils. 14, 2;—*T. citrinus*, Tem. Col. 445;—*T. rubripes*, Id. 409;—*T. leucogaster*, Enl. 648, 1;—*T. madagascariensis*, Enl. 557, 1;—*T. australasiæ*, Sh. Nat. Miscel. 1013;—*Malurus frenatus*, Tem., Col. 385;—*T. pectoralis*, Enl. 644, 1; T. *cinnamomeus*, Enl. 560, 2;—T. *rufifrons*, Enl. 644, 10. These last three species have been improperly referred by Buffon to the Ant-catchers.

N.B. *Turdus aurocapillus*, Lath., Enl. 398, 2 and Vieill. Am. 64, (*Motac. aurocap.*, L.,) is a true Motacilla, and must be placed with the Fauvets;—*Turdus calliope* (Lath. Syn. Supplement, fig. of the title), should go with the Redbreasts;—*Turdus cayanus*, Enl. 515, is a female Ampelis;—*T. guyanensis*, Enl. 398, fig. 1, is a female of the *Tanagra dominica*, Enl. 156, 2, of which Vieill. has made his *Dulus palmarum*, Gal. 146. *See App. XVI of Am. Ed.*

(1) We have already spoken, while on the Shrikes, of some species usually placed among the Thrushes, such as, *Turdus zeilonus*, Enl. 272. It seems we might also approximate to it the *T. cafer*, Enl. 563, Vaill., 107, which differs very little even in colouring from the *Lanius jocosus*, Enl. 508. These two species would also take along with them the *T. capensis*, Enl. 317, Vaill. 105, and the *T. chrysorrhœus*, Tem., Vaill. 107.

On the other hand, it would be difficult to separate from the zeilonus, the *Haussecol noir*, Vaill. Afr., 110, and the *Cravatte noir*, Id. 115.

(2) Particularly *Turdus auratus*, Enl. 540 (*Nabirop*, Vaill. Afr. 89), and *Turdus nidens*, Enl. 561, (*Couigniop*, Vaill., 90.)

Here also come the *Oranvert* (*T. chrysogaster*, Gm.) Enl. 358;—the *Sprédo* (*T. bicolor*, Gm.), Vaill., Afr., 83, or the *Corvus rufipennis*, Sh.; and probably the *Eclatant*, Vaill. 85, and the *Choucador*, Id. 86, (*Corvus splendidus*, Sh.)

(3) *Turdus æneus*, Enl. 220 (*Vert doré*, Vaill., 87).

We consider it proper to approximate to it the *Thrush of New Guinea*, whose tail is three times the length of the body, and has a double tuft on the head, which has been considered a Bird of Paradise—*Paradissæa gularis*, Lath., and Shaw; *Par. nigra*, Gmel.; Vaill. Ois. de Par. 20 and 21; Vieill. Ois. de Par. pl. viii, and Galer. 107, simply on account of the singularity and incomparable magnificence of its plumage.(1)

Other Thrushes, with brilliant plumage, have the feathers of the occiput pointed like the Starling; they are the Stournes or Lamprotornis of Temminck.(2)

Some of them have so slender a beak, that they approach the Saxicolæ—the Turdoides, or Ixos, Temm.;(3) others again have a slender but strong and straight beak, and among them are some with a widely forked tail, Enicures, T.(4)

There are some of them also, which are distinguished by the height of their legs, which gives them the appearance of Waders, they are the Grallines of Vieill. Galer. 150; or the Tanypus of Oppel. Mem. Acad. Munich, 1812, pl. viii.

The Criniger, Temm., comprehends those Thrushes, which have very strong setæ on the beak, and whose neck feathers sometimes have a setaceous termination. Such is the *Criniger barbatus*, Col. 88.

Buffon has very properly separated from the Thrushes, the

Myothera, Illig.(5)

The Ant-Catchers are known by their long legs and short tail. They

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(1) Vieillot has given to this bird the generic name of Astrapia.

N.B. I think it is proper to approximate to the Thrushes which are allied to the Shrikes, the *Muscicapa carinata*, Swains., Zool. Ill., 147, of which Vigors and Horsfield make their genus Monarcha.

(2) *Turdus mauritianus*, Gm., Enl. 648, 2 and Col. 149;—*T. cantor*, Sonnerat, Voy. I, pl. lxxiii;—*Lamprotornis metallicus*, Tem. Col. 266. We should distinguish the *Lampr. erythrophris*, on account of its beautiful red eye-brows formed of cartilaginous feathers.

(3) Such are the *Podobé* (*T. erythropterus*, Gm.), Enl. 334;—the *Janfredic*, Vaill. Afr. 111;—the *Grivetin*, Id., 118;—the *Coudor*, Id., 119;—the *Turdus trichas*, Enl. 709, 2. The *Terat-boulan* (*Turdus orientalis*, Gm. Enl. 273, 2,) approximates this group to the straight-beaked Shrikes.

Add, *Ixos chalcocephalus*, Tem. Col. 453, 1;—*I. squammatus*, Ib. 2;—*R. atriceps*, Col. 137, and particularly *T. dispar*, Col. 137, which has red cartilaginous feathers under the throat similar to the appendages of the wing of the Chatterer.

(4) *Ænicurus coronatus*, Tem. Col. 113, or *Turd. Leschenaultii*, Vieill. Gal. 145, or *Motacilla speciosa*, Horsf.;—*Ænic. velatus*, Tem. Col. 160. There is quite as much reason for approximating them to the straight-beaked Shrikes.

(5) Vieill. has changed this name into Myrmothera.

live on insects, and chiefly on ants. They are found in both continents.

Those of the eastern world, however, are remarkable for the brilliant colours of their plumage: they are the Breves of Buffon(1)—*Corvus brachyurus*, Gm., Enl. 257 and 258; Edw. 324, to which have been added since, several other beautiful species.(2) We must also add the *Azurin*—*Turdus cyanurus*, Lath., and Gmel.; *Corvus cyanurus*, Shaw, Enl. 355,(3) which only differs in the tail, which is somewhat pointed.

The species belonging to the western continent, are much more numerous, their tints are of a deeper brown, and they vary as to strength, and the length of the beak. They obtain their living from the enormous ant hills which abound in the woods and deserts of that country; the females are larger than the males. These birds seldom fly, and have a sonorous cry, which, in some species, is even extraordinary.

Among those with a thick and arcuated beak, we remark,

M. rex; Turdus rex, Gm.; *Corvus grallarius*, Shaw, Enl. 702. (King of the Ant-Catchers.) The largest of all, and stands the highest; its tail, on the other hand, is the shortest, and at the first glance it might be taken for a Wader; it is about the size of a Quail, and its grey plumage is agreeably chequered. It is more solitary than the others.(4)

The species with a straighter, but still tolerably strong beak are allied to the Shrikes, with a similar one.(5)

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(1) Vieillot has given to these birds the name of Pitta.

(2) Such as the *Pitta erythrogaster*, Cuv., Enl. 212;—*P. gigas*, Tem. Col. 217;—*P. cyanoptera*, Id. Ib., 218;—*P. superciliosa*, C.—*P. strepitans*, Leadbeater, Col. 333.

N.B. The *Breve des Philippines*, Enl. 89, is not, as Vaillant says, that of *Angola*, Edw., 324, with the head of a Thrush artificially attached to it; we have a natural specimen of the same.

(3) The *Azurin* is not from Cayenne, as Buffon declares it to be, but from the East Indies. It is the *Pitta cyanura*, Vieill., 153. Add *Myiothera affinis*, Horsf. and even his *Turdus cyaneus*, which is the *Brève-bleuet*, Tem. Col. 194, but which leads to the straight-beaked Shrikes.

The *Pitta thoracica*, Tem., Col. 76, which Messrs Horsf. and Vigors make the type of their genus Thimalia, is but little removed from the azurin, if we except its sombre hues and its beak, which latter diminishes more regularly in front, and thereby approaches the Tanagers.

(4) M. Vieillot has taken his genus Grallaria, Galer. 154, from this bird.

Add the *Grand beffroi* (*Turdus tinniens*), Enl. 706, 1 of which Vieill. makes his genus Myothera: its beak is smaller;—*Myrmothera guttata*, Vieill. Gal. 155.

(5) Such are the *Tetema* (*Turdus-colma*, B.) Enl. 821;—the *Palicour* (*T. formicivorus*,) Enl. 700, 1;—the *Petit beffroi* (*Turdus lincatus*), Enl. 823, 1;—the *Tham-*

Others have a slender, sharp beak, which, with their striated tail, approximates them to the Wren.(1)

The Orthonyx, Tem. may be approximated to the Ant-catchers. They have the beak of a Thrush, but, it is short and slender; their legs are long, the nails almost straight, and the quills of the tail terminate in a point like those of the Creepers.

We must also separate from the Thrushes:

Cinclus, Bechst.(2)

Or the Water-Thrushes, which have a compressed, straight beak, with mandibles of an equal height, nearly linear, and becoming sharp near the point; the upper one hardly arcuated. There is but one in Europe.

Sturnus cinclus, L.; *Turdus cinclus*, Lath.; Enl. 940; Vieill. Gal. 152. (The Water Thrush.) Legs rather long, and a short tail, which approximate it to the Ant-catchers. It is brown, with a white throat and breast, and has the singular habit of descending into the water, not swimming, but walking about on the bottom in search of the little animals which constitute its food.

Africa, and the countries bordering on the Indian Ocean, produce a genus of birds neighbours of the Thrushes, which I call

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nophilus stellaris, Spix, 39;—*Thamn. myotherinus*, Id. 42. The *M. leucophris*, Tem. Col. 448, although from Java, seems to approach this group. The *Brachypteryx montana*, Horsf. Jav. also approximates to it in the height of its legs, but its tail is longer in proportion, and the beak is somewhat allied to that of the Saxicolæ.

(1) Such are the *Bambla* (*Turd. bambla*), Enl. 703; the *Arada* (*T. cantans*), Enl. 706, 2. Here comes the genus Rhamphocene, Vieill. 9, 128.

We are compelled, however, to replace among the Thrushes, several species which Buffon arranged with the Ant-catchers, on account of some relative similarity of colour, viz. the *Carillonneur* (*T. tintinnabulatus*), Enl. 700, 2;—the *Merle à cravatte* (*T. cinnamomeus*), Enl. 560, 2;—those of the pl. Enl. 644, 1 and 2, which, contrary to all appearances, he considers as varieties of the *formicivorus*. I place in the same class the *Thamnophilus griseus*, Spix, 41, 1 and 48, 2;—*striatus*, Id., 40, 2;—*melanogaster*, Id., 43, 1. The *Myothera capistrata*, *melanothorax*, Tem. Col. 185, [and *M. obsoleta*, Bonap. I, p. 1, 2. *Am. Ed.*]. We must also send back to the Thrushes, notwithstanding their smallness, the long-tailed species, called by Buffon *Fourmilliers rossignols* (*T. coroya* and *T. alapi*, Gm.), Enl. 701, as well as the *Myiothera malura*, Natterer, Col. 953 and the *M. ferruginea* and *rufimarginata*, Col. 132, which are even closely allied to the *T. punctatus* and *grammiceps;*—the *M. gularis* and *pyrrhogenis*, Tem. 442, 448.

The *Myiothera mentalis* and *strictothorax*, Natterer, 179, appear to me should be placed among the Shrikes. There is no group which has been more overloaded with species foreign to it, than that of the Ant-catchers. We must confess, however, that it is not more rigorously limited than the other groups of the Dentirostres.

(2) Vieillot has changed this name into that of Hydrobata.

Philedon.(1)

Their beak is compressed, slightly arcuated throughout its length, and emarginate near the point; nostrils large, and covered by a cartilaginous scale; their tongue terminated by a pencil of hairs.

The species, generally remarkable for some singularity of conformation, have been bandied about by authors in all kinds of genera.

Some of them have fleshy bobs at the base of the beak.(2)

In others, portions of the skin on the cheeks are divested of feathers.(3)

Even in those which are completely feathered, we still observe, at times, a singular disposition of the plumage.(4)

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(1) Commerson had an idea of thus naming the *Polochion* (*Merops moluccensis*, Gm.), which is of this genus. See Buff. Hist. des Ois , VI, 4to, p. 477. Vieillot places the greater number of these birds in his genus *Polochion*, and in Latin he prefers calling it *Philemon* rather than *Philedon*, Gal. 189. The genus Meliphaga of Lewin also is comprised in it.

(2) Here comes the New Holland bird called by Daudin, Ornith. II, pl. xvi, *Pie à pendeloques*, or *Corvus paradoxus*, Vieill. Gal. 24, the same as the *Merops carunculatus* of Phillip., of Latham and of Shaw, but which has not the feet of a Merops, and whose beak is notched, the tongue pencillated, and nostrils without feathers. The *Sturnus carunculatus*, Lath. and Gm., or *Gracula carunculata*, Daud. and Shaw (Lath. Syn., III, pl. xxxvi), and the *Certhia carunculata*, Lath. and Gm. (Vieill. Ois. Dor., II, pl. lxix), also appear to me to belong to it. The latter bird, it is said, sings delightfully, and belongs to the Friendly Islands. It is from this subdivision that Vieillot has taken his genus Creadion, Gal. 94.

(3) The *Merops phrygius* of Shaw, Gen. Zool. VIII, pl. xx;—the *Goruck*, Vieill. Ois. Dor., II, pl. lxxxviii (*C. goruck*, Sh.);—the *Fuscalbin*, Id. Ib., pl. lxi, (*C. lunata*);—the *Graculé*, Id. Ib., pl. lxxxvii, (*C. graculina*);—the *Polochion* of Buff. (*Merops moluccensis*, Gm.);—the *Ph. à oreilles jaunes*, Less. Voy. de Duperrey, pl. 21, bis, and some new species belong to this division.

(4) Particularly in the *Merops Novæ Hollandiæ*, Gm. and Brown, Ill. ix, or *Merle à cravatte frisée*, Vaill., Afr., or *Merops circinnatus*, Lath. and Shaw, Gen. Zool. VIII, pl. xxii. They are the feathers of the ears which become frizzled, as they descend to almost in front of the breast.—*Melliph. auricornis*, Swains., Zool. Ill. p. 43.

Add *Certh. auriculata*, Vieill. Ois. Dor. 85;—*C. Novæ Hollandiæ*, Ib. 7.

The species which have none of these singularities are the *Certhia xantotus*, Sh. Vieill. Ois. Dor., II, pl. 84;—*C. australasiana*, Ib. 55;—*C. mellivora*, Ib. 86;—*C. cærulea*, Ib. 83;—*C. seniculus*, Ib. 50. I am even of opinion that the *Cap noir*, Vieill. pl. 60, (*Certhia cucullata*, Sh.) belongs to them, notwithstanding the length of its beak;—*Merops niger*, Gm. or *fasciculatus*, Lath. or *Gracula nobilis*, Merrem. Beytr. Fasc., I, pl. ii, is still more likely to be one of them—at all events it is no Merops. I also place in this genus the *Verdin de la Cochinchine*, Enl. 643, which is the second *Turdus malabaricus*, No. 125 of Gm.—for the first, No. 51 is a Gracula, Cuv.—and the *Certh. cocincinica*, Sh. Vieill. 77 and 78.—Add the *Philed. cap négre*, Tem. (*Certhia atricapilla*, Lath.), Col. 335, 1;—*Philéd. moustac.* (*Melliph. mystacalis*, Tem.) Ib. 2;—the *Philéd. grivelé* (*Melliph. maculata*, T.), Col. 29, 1;

Eulabes, Cuv.

The birds of this genus are closely allied to those of the preceding one. Their beak is nearly that of a Thrush; their nostrils are round and smooth. Their distinguishing mark consists in broad strips of naked skin on each side of the occiput, and a bald spot on the cheek.

Linnæus has confounded two species of them under the name of *Gracula religiosa*.(1)

E. indicus, Enl. 268, the species of India, is the size of a Thrush; black, with a white spot near the base of the primaries. The feet, beak, and bald parts of the head, yellow.

E. javanicus, Vieill. Gal. 95, has a broader beak, the commissure extending higher up, more hooked at the end, and without a notch—consequently, it should come after Colaris, Cuv.; but in every thing else it is precisely similar to the other and particularly in the strips of bare skin about the head.(2) Of all birds, this one is said to imitate most completely the language of man.

Gracula, Cuv.(3)

Is another genus allied to the Thrushes. The species inhabit Africa and the countries bordering on the Indian Ocean. Their beak is compressed, very little arcuated, and slightly emarginate; its commissure forms an angle like that of the Starling. The feathers on the head are almost always narrow, and there is a naked space round the eye. They have the habits of Starlings, and like them, pursue insects in flocks.

One species is occasionally seen in Europe,

Turdus roseus, L.; *Pastor roseus*, Meyer; *Merula rosea*, Naum. 63; Enl. 251; Vaill. Afr. A brilliant black; back, rump, scapulars and breast of a pale rose; feathers of the head narrow, and

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Phil. réticulé (*Melliph. reticulata*), Ib. 2;—the *Ph. á joues blanches* (*M. leucotis*), Col. 435;—*Phil. Dumerilii*, Voy. de Duperr. pl. xxi, and perhaps the *White headed Ixos*, Ruppel, Av. 4.

N.B. The Creadion or *Pie à pendeloques* is the genus Anthochæra of Swainson, to which he joins the *Merops phrygius*, &c. The long and slender billed Philedons, such as the *Certhia cucullata*, Vieill., form the genus Myzomela of Swainson.

(1) This appellation of *religious* was only given to it on account of a peculiar trait in its character, related by Bontius (Med. Ind. or. p. 67,) and foreign to its natural habits. I have made it my generic name by translating it into Greek.

(2) Nothing can possibly be more perplexing to methodists than this difference between the beaks of two such similar birds.

(3) Vieillot has changed this name into that of Cridotheres, Galer. 148.

lengthened out into a tuft. It is of great use in warm climates, by destroying Grasshoppers.(1)

Another species, *Paradisæa tristis*, Gm.; *Gracula tristis*, Lath. and Shaw; *Gracula gryllivora*, Daud. Enl. 219, has become celebrated for similar services rendered to the Isle of France. It feeds, however, on every thing, builds on the Palms, and is very docile. Its size is that of a Thrush; brown, blackish about the head; a spot near the tip of the wing; the lower part of the abdomen and the tips of the lateral tail quills are white.(2)

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(1) Since my first edition was published, I have satisfied myself of the certainty of the generic affinity of this species with the Gracula, Cuv.

(2) It is difficult to imagine how Linnæus was induced to make it a Bird of Paradise. To this genus also belong the *Gracula cristatella*, Enl. 507 and Edw. 19, which can hardly be considered a variety of the common one;—the *Porte lambeaux*, Vaill. Afr. pl. xciii, and xciv, which is the *Gr. carunculata*, Gm., or the *Gr. larvata*, Shaw, or the *Sturnus gallinaceus*, Daud.;—the *Martin brame*, *Turdus pagodarum*, Vaill. Afr., 95, and Vieill. Gal. 148. The first *T. malabaricus*, the *T. ginginianus*, the *T. dominicanus*, Enl. 627, 2; the *Martin gris de Fer*, Vaill. Afr. 95, 1, and the *Sturnus sericeus*, Gm. also belong to it, as well as some new species. I also refer to it, conjecturally, the *Turdus ochrocephalus*, Lath. (*Sturn. ceylanicus*, Gm.) Brown, Ill., xxii.

N.B. We cannot ascertain what type was taken by Linnæus and his followers for their genus Gracula. Linnæus first formed it in his tenth edition of seven very discordant species, viz. 1, *religiosa*, Eulabes, C.; 2, *fetida*, which I suspect to be the *Col nu*, that is to say allied to Ampelis; 3, *barita*, and 4, *quiscala*, which belong to Cassicus; 5, *cristatella*, which is a Gracula, Cuv.; 6, *saularis*, or rather *solaris*, which is a straight-beaked Shrike, and the same bird as *T. mindanensis*, Enl. 627, 1; finally, 7, *Atthis*, which is a Thrush.

In the 12th ed. he added the *Gracula calva*, and placed the common gracula, Cuv. among the birds of Paradise.

Gmelin, in imitation of Pallas, added a *xanthornus* (Gr. longirostra.).* He also placed there the *porte-lambeaux* (*Gr. carunculata*), still leaving the common one among the Birds of Paradise; finally, he placed there the *Gr. cayennensis*, which is a Creeper. M. Latham has transferred to it the *Gr. tristis*, the *Col. nu* (*Gr. nuda*) and one of my Philedons (*Gr. icterops*).† Daudin has placed some species after the said Gracula which in fact resemble it, and two of which Gmelin had left among the Thrushes (*Turdus pagodarum* and *malabaricus*). Finally, Shaw has put the finishing touch to the matter, by transferring to the genus in question three *Baritæ*, (his *Gr. strepera*, *varia* and *tibicen*,) and adding to them the *Talapiot*, which is a Creeper or a Nuthatch (*Gr. picoides*). Genera, thus formed, certainly excuse the ill humour of the enemies of systems, if they do not justify it. See the Mem. of M. Lichtenstein, Acad. of Berlin, 1817.

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* I do not know the *Gracula sturnina* of Pallas.

† Neither do I know the *Grac. melanocephala* and *viridis* of Latham; but I suspect they also belong to my Philedons.

Manorhina, Vieill.

The beak much compressed, but little arcuated, and slightly sloped; large nostrils, almost entirely closed by a membrane, which reduces the opening to a narrow slit; the neck is short. The feathers on the forehead, which are as soft as those of young birds, incline partly over the nostrils.(1)

Pyrrhocorax, Cuv.(2)

The compressed, arcuated, and sloped beak of the Thrushes; but their nostrils are covered with feathers, as in the Crows, to which they were for a long time united. There is one in Europe about the size of the *Corv. monedula.*

Corvus pyrrhocorax, L.; *Chocard des Alpes*, Enl. 531; Vieill. Galer. 106; Naum. 57, 1. All black; the beak yellow; feet, brown at first, then yellow and red in the adult; builds in rocky fissures of the highest mountains, whence, in the winter, it descends into the valleys in large flocks. It feeds on insects, snails, grain, and fruit, and does not despise carrion.

There is another in India,

Pyrr. hexanemus, Cuv.; the *Sicrin*, Vaill. Afr. pl. lxxxii. Distinguished by three barbless stalks as long as the body, which grow on each side among the feathers which cover the ear.

I can find no character sufficient to warrant removing from the Thrushes

Oriolus, Lin.

Or the Orioles, whose beak, similar to that of the Thrushes, is merely a little stronger; the feet a little shorter, and the wings a little longer, in proportion. Linnæus, and most of his followers, improperly united Cassici with them, to which they have no other resemblance than that of colours.

O. galbula, L.; *Le loriot d'Europe*, Enl. 26; *Golden Thrush*, *Yellow Thrush* of the Germans, &c. Somewhat larger than the Thrush. The male is of a fine yellow; wings, tail, and a spot between the eye and the beak, black; tip of the tail yellow. During its two first years, however, the yellow is replaced by an olive, and the black by a brown, which is always the case with the female. This bird suspends its skilfully wrought nest to branches of trees, feeds on cherries and other fruits, and in the spring on insects. It is very shy, remains in France but a little time during the summer, and travels in pairs, or by threes.

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(1) *Manorhina viridis*, Vieill. Gal. 149;—*Merops albifrons*, Shaw ?

(2) Vieill. has adopted this name and genus.

India produces some species tolerably similar to the preceding,(1) but we must particularly distinguish from among that number the *Oriolus regens*, Col. 320—*Sericula regens*, Less. which is of the finest silky black, with beautiful orange yellow, velvet feathers on the head and neck, and a large spot of the same colour on the wing.(2)

Gymnops, Cuv.

The same strong beak as the Orioles; the nostrils round, without scales or surrounding membrane; a great part of the head naked.(3)

Some of them have prominences on the beak.(4) In these the tongue is pencillated as in Philedon.

Mæura, Shaw.

These Birds, whose size has induced some authors to refer them to the Gallinaceæ, by the separation of their toes, (the first joint of the external and middle ones excepted,) evidently belong to the order of the Passerinæ, and approach the Thrushes in their beak, which is triangular at base, elongated, slightly compressed, and emarginate near the point. The membranous nostrils are large, and partly covered over by feathers, as in the Jays. They are distinguished by the great tail of the male, which is very remarkable for the three sorts of feathers which compose it, viz. the twelve common ones with very fine and widely separated barbs; two more in the middle only one side of which is furnished with thickly set barbs, and two external ones curved into the figure of an S, or like the arms of a lyre, whose internal barbs, large and thickly set, form a kind of broad riband, while those that are external are very short, becoming

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(1) *Oriolus chinensis*, Enl. 570;—*Or. melanocephalus*, Enl. 79, or *Loriot rieur*, Vaill. Afr. 263;—the *Loriot d'or*, Vaill., 260; Vieill. Gal. 83;—the *Coudougnan*, Vaill., 2, 61;—the *Oriolus xanthonotus*, Horsf. Jav.

(2) M. Lesson (Voy. Duperr., pl. xx,) gives as its female, a Thrush-coloured bird which differs considerably in its proportions.

(3) The *Goulin gris* (*Gracula calva*, Gm.), Enl. 200;—the *Goulin vert* (*Mino Dumontii*, Less.), Voy. de Duperr., pl. xxv;—the *Goulin olive* (*Gracula cyanotis*, Lath.; *Merops cyanotis*, Shaw).

(4) The *Corbicalao*, Vaill., Ois. d'Am. et des Indes, pl. xxiv (*Merops corniculatus*, Lath. and Shaw,) and a neighbouring species whose larger tubercle is directed towards the front (*Mer. monachus*, Lath.). These two New-Holland birds are neither Horn-bills nor Bee-eaters, for their external toes are not more united than those of the most common Passerinæ.

N.B. The *Or. regens* is the *Melliphaga regia* of Lewin and the *Sericulus chrysocephalus* of Swainson.

The *Corbicalao* forms the genus Tropidorhynchus of Swainson.

longer only near the tip. The female has only twelve ordinary quills.

This singular species, *Mænura lyra*, Vieill. Ois. de Par. pl. xiv, xv, and Gal. 192, Sh. Nat. Misc. 577, inhabits the rocky districts of New Holland; its size is somewhat less than that of the Pheasant.

Motacilla, Lin.

The Warblers form an excessively numerous family, known by the beak, which is straight, slender, and similar to a bodkin. When slightly depressed at base, it approaches that of the Flycatchers; when compressed, and its point is curved a little, it leads to the straight beaked Shrikes. An endeavour has been made to divide them as follows:

Saxicola, Bechst.(1)

The beak a little depressed, and rather broad at base, which particularly allies these birds to the last small tribe of the Flycatchers. They are lively, and stand tolerably high. The French species build on the ground, or under it, and feed exclusively on insects.

Motacilla rubicola, L ; *Le Traquet*, Enl. 678; Naum. 90, 3, 1, 5. A small brown bird, with a red breast, black throat, and some white on the sides of the neck, on the wing, and on the rump. It is constantly flitting about the bushes, and its weak note resembles the tick-tack of a mill, whence its French name.

Mot. rubetra; Le Tarier, Enl. 678; Naum. 89, 3, 4. Closely resembles the preceding; but the black is on the cheek instead of under the throat. It is somewhat larger, and keeps more on the ground. France.

Mot. œanthe; Le Motteux, Enl. 554; Naum. 89, 1, 2. (The Wheat-Ear.) The rump, and the half of the lateral tail feathers, white. The male is ash coloured above, reddish-white beneath; the wing, and a band over the eye, black. In the female, all is brownish above, and reddish beneath. It is found in the ploughed fields, where it feeds on the worms turned up with the furrow. France.

We should distinguish from them,

Saxicola strapasina, T.; *M. roux*, Buff.; Naum. 90, 1, 2. A species from the south of Europe that sometimes visits France. There is a bird in the south of France that should be placed near this species, which is black, the rump, and the two superior thirds of the tail, white, and which has been referred to the

(1) Vieill. has changed this name to *Motteux* (Œnanthe).

Thrushes. It is the *Turdus leucurus*, Lath., Synops. II, pl. 38;(1) or the *Saxicola cachinnans*, Tem.

SYLVIA, Wolf and Meyer.—FICEDULA, Bech.

The beak a very little narrower at base than in the preceding. They are solitary birds, generally nestling in holes, and feeding on insects, worms and berries. There are four species in France.

Mot. rubicola, L.; *Rouge-gorge*, Enl. 361, 1; Naum. 75, 1, 2. (The Stonechat.) A brown grey above; throat and breast red; belly white; builds near the ground in the woods, is prying and familiar. Some of them remain during the winter, and seek for refuge from the extreme cold in houses, where they soon become tamed.

Mot. suecia, L.; *Gorge-bleue*, Enl. 361, 2; Naum. 75, 3, 4, 5. Brown above, blue throat, red breast, white belly; rarer than the preceding, nestles on the edge of woods and marshes.

Mot. phœnicurus, L.; *Rossignol de muraille*, Enl. 351; Naum. 79, 1, 2. Brown above; throat black; breast, rump, and lateral quills of the tail, light red; it nestles in old walls, and has a soft song, with something of the modulations of the Nightingale.

Mot. erithacus, *tytys*, *gibraltariensis*, *atrata*, Gm.; Edw. 29; Naum. 79, 3, 4. Differs from the preceding, and principally in the breast, which, as well as the throat, is black. It is much more uncommon.(2)

CURRUCA, Bechst.

A straight beak, slender throughout, slightly compressed before; the upper mandible a little curved near the point. The most celebrated of this subgenus is

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(1) Add to the saxicolæ, *Mot. caprata*, Enl. 235;—*M. fulicata*, Enl. 185, 1;—M. *philippensis*, Ib. 2;—the *patre*, Vaill. Afr. p. 180.

And to the wheat-ear, M. *leucothoa*, Enl. 583, 2;—the *imitateur*, Vaill., Afr. 181, Id.;—the *familier*, Id. 183;—the *montagnard*, Id. 184;—the *fourmillier*, 186;—*Mot. leucomela*, Falc. Voy. III, xxx, and Col. 257, 3. Add, *Saxic. aurita*, t., Col. 257, 1;—*S. monacha*, Col. 359, 1;—*S. deserti*, Ib. 2.

The *Mot. cyanea*, Gm., Lath, Syn. II, pl. liii, has the beak of a Saxicola, and only differs from it in having a rather longer tail. Vieill. Gal. 163, has placed it in his genus MERION or MALURUS, afterwards converted into a receptacle for all kinds of birds with elongated and cuneiform tails, such as the *Mérion bridé*, Tem. Col. 385, which is a Thrush;—the *M. natté* and the *M. leucoptére*, Quoy and Gaym. Voy. de Freycin. pl. 23, which approach the *Coly;* the *flâteur* of Vaill. (*M. africana*), Afr. 112, which is closely allied to *Synallaxis*, &c.

(2) Add the Blue bird of Amer. *Mot. sialis*, Enl. 590; *Mot. Calliope*, Lath. Syn. Supp. I, front. [*See App. XVII of Am. Ed.*]

Mot. luscinia, L.; Enl. 615, 2; Naum. 74, 2. (The Nightingale.) A reddish brown above; whitish grey beneath; the tail somewhat redder. Every one knows this songster of the night, and the varied melody with which it fills the woods. It builds on trees, and does not begin to sing until the young ones are hatched. The male, then, as well as the female, is occupied in providing them with food.

The eastern part of Europe produces a Nightingale, which is a little larger, and whose breast is slightly variegated with greyish tints. *Mot. philomela*, Bechst.; Naum. 74, 1.

The remaining species have the common name of *Fauvettes;* they are, nearly all, good singers, lively and gay in their manners, constantly flitting about in pursuit of insects, and building in bushes, generally in the vicinity of water, among reeds, &c.

I place a species at the head of the list, which is so large that it has been almost always classed with the Thrushes.(1) It is *Turdus arundinaceus*, L.; *Sylvia turdoides*, Enl. 515; Naum. 81, 1. Reddish brown above; yellowish beneath; throat white; a pale streak over the eye; a little less than the Mavis, (*Turd. iliacus*, L.) and the beak almost as much arcuated. It nestles among the reeds, and feeds almost exclusively on aquatic insects.

Mot. arundinacea, Gm.; *La Petite Rouserolle*, Naum. 81, 2. Similar to the preceding in habits and colour, but not so large by a third.

Mot. salicaria, Gm.; *La fauvette de Roseaux*, Enl. 581, 2. Still smaller than the last, and the beak proportionably shorter; an olive grey above; very pale yellow beneath; a yellowish streak between the eye and the beak.

There are also several small *Spotted Fauvettes*, inhabiting marshes, &c., which were long confounded under that general name, (*Mot. nævia*, Gm.) and which are not yet satisfactorily distinguished.(2)

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(1) There are some intermediate Fauvettes between the *Mot. arundinacea*, Gm. and the *Turd. arundinaceus*, L., and between the former and the *Mot. salicaria*, Gm., so that, in my opinion, it is impossible to separate the latter from the Fauvettes, although I acknowledge the result is an almost insensible transition between the Thrushes and the Motacillæ, just as there is between the latter and the straight beaked Shrikes, and between the Thrushes and the Shrikes with arcuated beaks. All these genera are closely allied.

(2) See the *S. phragmitis*, Naum. 82, 1;—*S. cariceti*, Id. 2, 3;—*S. aquatica*, Id. 4 and 5;—*S. fluviatilis*, Id. 83, 1;—*S. locustella*, Id. 84, 2, 3. Compare them with the *S. locustella*, Roux, 229;—*S. Schænobenus*, Id. 230;—*S. paludicola*, Id. 231,—*S. cysticola*, Id. 232; as well as the figures of Buff., Brisson, Bechstein, &c. There is

Of the above, we will merely notice the F. cysticole—*F. cysticola*, Tem. Col. 6, 3, with a fawn coloured back, spotted with black, a light fawn colour beneath; the tail cuneiform, each feather of which has a black spot on its inferior surface. This species is from the south of Europe, and makes its nest by approximating the leaves of a tuft of grass or carex, which it sews together with the filaments of various seeds.(1)

Among the species which prefer the higher grounds, we observe first,

Mot. atricapilla, L.; *Fauvette à tête noire*, Enl. 580, 1 and 2; Naum. 77, 2, 3; Roux, 205, bis. Brown above; whitish beneath; a black calotte on the male, a red one on the female.

Mot. orphea, Tem.; *La Fauvette*, Enl. 579, 1; Naum. 76, 3, 4; *S. grisea*, Roux, 213. One of the largest; ashy brown above, whitish beneath; some white on the tip of the wing; two-thirds of the external quills of the tail white, the succeeding one marked with a spot at the end, and the rest with a selvage. There have been distinguished within the last few years,

Sylvia nisoria, Bechst.; *Fauvette rayée;* Naum. 76, 1, 2, Roux, 222. Which has much less white on the tail, the abdomen of the female being transversely undulated with grey; the largest of the European species.

Mot. curruca, L.; Brit. Zool. pl. v, No. 4; Frisch. 21; Naum. 77, 1; Roux, 216. (The White Throat.) Smaller than the preceding ones, and the beak more slender, but the same white on a great part of the first quill of the tail. The head is ash coloured, back brownish.

Mot. sylvia, Gm.; *S. cinerea; Fauvette roussâtre;* Naum. 78, 1, 2; *Riet-vink*, Nosem. II, pl. 97; Enl. 579, 3; Roux, 220. Reddish brown-grey above, white beneath; the white on the tail as in the two preceding ones; the quills and coverts of the wings edged with red.

Mot. salicaria, L.; *Sylv. hortensis*, Bechst.; *La petite Fauvette*, Naum. 78, 3; Nosem. 72; Enl. 579, 2; Roux, 221. Has

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no genus which stands more in need of a monography and an approximation of the synonymes of different authors, than this.

Add to the aquatic Fauvettes of Europe, *Sylv. galactodes*, T. Col. 251, 1;—*S. luscinioides*, Savi. Egypt. Ois. XIII, A;—*S. cetti*, Marmora or la *Bouscarle*, Enl. 6, 55, 2; Roux, 212;—*S. melanopogon*, Tem. Col. 245, 2.

(1) See *Notizia sul nido del Beccamorchino* (*Sylvia cysticola*, Tem.) by *S. P. Savi. Pisa*, 1823.

no white on the tail, and is of a brownish grey, or olive above, and of a yellowish white beneath.(1)

Bechstein has separated from the other Fauvette his ACCENTOR, which is the *Fauvette des Alpes*, Buff.—*Mot. alpina*, Gm.; Enl. 668, or the *Pegot*, Vieill. Gal. 156; Naum. 92, 1;(2) because the edges of its slender beak, which is more exactly conical than that of the other Motacillæ, are slightly depressed.

It is a fulvous bird, with a white throat, sprinkled with black; two rows of white spots on the wing; some bright red on the flanks. It is found in the pastures of the upper Alps, where it feeds on insects, and whence, in winter, it descends into the villages in search of grain, &c.

I think I have observed the same beak in the *Fauvette d'hiver. Mot. modularis*, L.; *Traine-buisson*, &c.; Enl. 615, 1; Naum. 92, 3, 4.(3) The only species that remains in France during the winter, and that in some measure relieves the dreariness of the season by its delightful notes. It is of a fawn colour, spotted with black above, and a slaty ash colour beneath. It builds twice a year, and in the summer proceeds to the North, and seeks the mountain forests. During the winter, or where insects are not to be had, it is contented with grain.

The gizzard of these two birds is more fleshy than that of the other Fauvettes.(4) We may add to them,

Acc. montanellus, Tem.; Naum. 92. A bird from the south-east of Europe.

We may also distinguish some long and cuneiform tailed Motacillæ, which have been left among the Fauvettes.(5)

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(1) The descriptions of the Fauvettes are so vague, and the greater part of their figures—those of Nauman excepted—are so bad, that it is almost impossible to determine their species. Each author arranges them differently. Our descriptions, therefore, may be confidently depended upon, but our synonymes not so much so; we think, however, we agree with Mess. Nauman and Roux.

To the species abovementioned, must be added: *Sylv. ruscicola*, Roux;—*S. passerina*, Col. 24, 1;—*S. sarda*, Ib. 2;—*S. Nattereri*, Ib. 3;—*S. subalpina*, Bonnelli, or *Leucopogon*, Meyer, Col. 6, 2 and 251, 2 and 3, Roux, 218.

N.B. According to Savi the *S. passerina*, Tem. Col. 29, 4, is the young male of the *S. subalpina*.—The *Pitchou* (*S. ferruginea*), Enl. 635, 1; Roux, 219. The small species lead to REGULUS.

(2) It is also the *Sturnus montanus*, and the *S. colluris* of Gmelin.

(3) I see this approximation has been adopted by Mess. Temm. and Nauman.

(4) Nitsch., ap. Naum., II, p. 939.

(5) *Mot. fuscata*, Gm. Enl. 584, 1;—*Motacilla macroura*, Gm. Enl. 752, 2; or the *Capolier*, Vaill. 129, 130, 1;—*Malurus galactodes*, T., Col. 65, 1; *Mal. marginalis*, T. Ib. 2;—*Mal. clamans*, Ruppel. pl. 2;—*Mal. squamiceps*, Id. xii.—*Mot. subflava*, Gm. Enl. 584, 2, probably the same as the *Citrin*, Vaill., Afr., 127;—the *Double*

Some of the species are very skilful in the construction of their nests, with cotton or other filaments, which they arrange with much art.(1)

Regulus, Cuv.

The beak slender, forming an extremely perfect and a very sharp pointed cone; when viewed from above its sides even appear slightly concave. They are small birds, which live among trees and pursue Gnats. There is in France,

Mot. regulus, L.; the *Roitelet*, Enl. 651, 3; Naum. 93, 1, 2, 3. The smallest of the European birds; an olive colour above, a yellowish white beneath; head of the male marked with a beautiful spot of a golden yellow, edged with black, the feathers of which are erectile. It constructs on trees a globular nest, with a lateral opening, suspends itself to the branches in every position like a Parus, and keeps near our houses in winter.(2)

A still smaller species has lately been observed, the yellow of which inclines more to the orange, and which has a black streak before and behind the eye.—*Regulus ignicapillus*, Naum. 93, 4, 5, 6.

Motac. trochilus, L.; *Le Pouillot*, Enl. 651, 1; Naum. 80, 3, Somewhat larger than the roitelet, of the same colour, but without the crown; its habits are similar, but it has a more agreeable song, and it removes on the approach of winter.

Motac. hypolais; Le grand Pouillot; Bechst. III, xxiv; Enl. 581, 2; Naum. 81, 1. Is still a little larger, and the abdomen more on a silver.(3)

The species foreign to Europe are extremely numerous, and are very often agreeably coloured.(4)

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sourcil, Id. 128. It is partly from this subdivision that Mess. Vieill. and Temm. have taken their genus *Merion* or *Malurus;* I should not, however, like the former, place in it the *Mot. cyanea*, Gm. which has the beak of a Saxicola.

N.B. The *Malurus galactodes*, Tem. has become the genus Megalurus of Vigors and Horsfield.

(1) Certain Fauvettes, such as the *S. sarda*, have a little circle round the eye. They form the genus Zosterops of Vigors and Horsfield.

(2) Add the *Roitelet omnicolor*, Vieill. Galer. 166.

(3) Add of European species: *Mot. sibilatrix*, Col. 245, 3; Naum. 80, 2;—*M. fitis*, Naum. 80, 3;—*M. rufa*, Naum. 80, 4.

(4) Such are the *Tscheric*, Vaill. 111, 121;—the *Cou-jaune* (*Mot. pensilis*), Enl. 685, 5;—*Mot. æstiva*, Enl. 58, 2;—the *Mot. ludoviciana*, Enl. 731, 2;—the *Fig. à poitrine jaune* (*Mot. mystacea*), Enl. 709, 2, Edw. 237, 2;—the *Fig. cendré du Canada* (*M. Canadensis*), Enl. 685, 2;—the *Fig. de l'isle de France* (*M. mauritiana*, Enl. 705, 1;—the *Plastron noir*, Vaill. 111, 123;—*Sylvia venusta*, Tem. Col. 293,

Troglodytes, Cuv.

The only difference between the Wrens and the present subgenus is, that in the latter the beak is still a little more slender and slightly arcuated. But one species is found in Europe.

Mot. troglodytes, L.; *Roitelet*, Enl. 651, 2; Naum. 83, 4. (The European Wren.) Brown, transversely striated with black; some white on the throat and the edge of the wing; a turned-up and short tail. It builds on the ground, and cheers us with its pleasing song even in the middle of winter.(1)

Motacilla, Bechst.

The Wagtails, to a still slenderer beak than that of the Fauvettes, add a long tail which they are continually raising and depressing, long legs, and scapular feathers sufficiently extended to cover the tip of the folded wing, which gives them an affinity with the greater number of Waders.

Motacilla, Cuv.

The true Wagtails still have the nail of the thumb curved like the rest of the group. They live along the shores of water courses.

That of France (*Mot. alba* and *cinerea*, L.), Enl. 652, is ash coloured above, white beneath; a calotte on the occiput; throat and breast, black.

The south of Europe produces one which when old has a black back, but resembling the preceding when young. It is the *Mot. lugubris*, Roux, 194.

Budytes, Cuv.(2)

In addition to the other characters of the true Wagtails, the nail of the thumb is here elongated and but slightly arcuated, which approximates these birds to the Larks. They generally remain in

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1;—*S. speciosa*, Ib. 2;—*S. palpebrosa*, Ib., &c. &c. Those whose beak is somewhat broad at base, are closely allied to the narrow-beaked Flycatchers. For the catalogue of species in the United States, see the paper by M. Ch. Bonaparte. Ann. New York Lyc. July 11, 1826, p. 76, et seq. *See App. XVIII of Am. Ed.*

(1) The Wrens foreign to Europe are allied to the Ant-catchers on the one hand, and to the Creepers on the other. Add the *Thriotore à long bec* (*Thr. longirostris*, Vieill. Gal. 168, or *Kampylorhynchus scolopaceus*, Spix, 79). [Add *Trog. aedon.* Wils. I, pl. iii, f. 3;—*Trog. palustris* (*Thyothorus arundinaceus*, Vieill.), Wils. II, pl. xii, f. 4;—*Trog. ludovicianus* (*Sylvia ludoviciana*, Lath.) Wils. II, pl. xii, f. v. *Am. Ed.*]

(2) *Budytes*, from its being seen among cattle.

pastures, and pursue insects among the cattle. The most common is,

Mot. flava; Bergeronnette de printems; Enl., 674, 2. Ash-coloured above, olive on the back, yellow beneath; the eyebrow and two-thirds of the lateral quills of the tail, white.(1)

ANTHUS, Bechst.

The Meadow Larks were long united to the Larks (Alauda), on account of the long nail of their thumb; but their slender and emarginated beak approximates them to the other Warblers, at the same time that their secondary quills and coverts, which are as short as usual, will not allow them to be confounded with Budytes. Those which still have the nail somewhat arcuated are in the habit of perching.

A. arboreus, Bechst.; *Alauda trivialis* and *minor*, Gm.; the *Pipi;* Enl. 660, 1;(2) Naum. 84, 2, Roux. Olive-brown above, reddish-grey beneath; breast spotted with black; two pale, transverse bands on the wing.

The thumb nail of others is exactly that of an alauda, and they generally remain on the ground.

A. pratensis, Bech.; *Alauda pratensis*, Gm.; *Alouette de pré*, Enl. 661, 2;(3) Naum. 84, 3 and 85, 1. Olive-brown above, whitish beneath; brown spots on the breast and flanks; whitish eyebrows; edges of the external quills of the tail, white. It prefers low or inundated meadows, and builds among reeds and tufts of grass. It becomes excessively fat in autumn by feeding on grapes, and is sought for at that period in France by the name of *Bec-figue* and *Vinette.*(4)

We will terminate this family of the Dentirostres with some birds distinguished from all preceding ones by their two external toes, which are united at base for about a third of their length, a circumstance which approximates them to the family of the Syndactyli.

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(1) Add the *Mot. boarula*, L. Edw., 259, and Vieill. Gal. 162.

(2) Under the false name of *Farlouse;* the *Pivote ortolane*, Buff. Enl. 642, 2 (*Motacilla maculata*, Gm.), is the young bird. See Roux, 288.

(3) Improperly called *Alouette pipi;* Nauman refers this figure to his *Anthus aquaticus*, of which he thinks it is the young male. We may observe that the synonymes of this subgenus are not less obscure than those of the Fauvettes.

(4) Add the *Anthus aquaticus*, Naum., 85, 2, 34;—*La Rousseline*, (*Anth. Campestris*), Enl. 661, 1; Naum., 84, 1; or *Alauda mosellana*, Lath. of which the young is called *Fist* in Provence, Enl. 654, 1 (*Motac. massiliensis*, Gm.) See Roux, p. 292;—the *Anth. Richardi*, Vieill. Id. 101, and Roux, 189, 190. Among those foreign to Europe place the *Alauda capensis*, Enl. 504, 2;—*Al. rufa*, Ib. 238, 1; probably the *rubra*, Edw., 297;—*Anthus rufulus*, Vieill. Gal. 161.

Pipra, Lin.

The Manakins have a compressed beak, higher than it is broad, and emarginated; large nasal fossæ. Their feet and tail are short; the general proportions of their form have long caused them to be considered as very similar to the Titmouse. At their head, but in a separate group, should be placed,

Rupicola, Briss.

The Rock Manakins, or Cocks of the Rock, which are large birds, and have a double vertical crest on the head, formed of feathers arranged like a fan. The adult males of the two American species, *Pipra rupicola*, Gm. Enl. 39 and 747; Vieill. Gal. 189, and *Pip. peruviana*, Lath. Enl. 745, are of a most splendid orange colour; the young of an obscure brown. They live on fruit, scratch the ground like the common Hen, and construct their nests with pieces of dry wood, in the depths of rocky caverns. The female lays two eggs.

Calyptomenes, Horsf.

Only differs from the preceding by the feathers on the head not being disposed like a fan; this same character, in a minor degree, may be observed in the *Pip. peruviana.*

There is a species found in the archipelago of India of the most beautiful emerald green—*Cal. viridis*, Horsf. Jav. which is not larger than a Thrush.

Pipra, Cuv.

The Manakins proper are small, and remarkable in general for their lively colours.(1) They live in small flocks, in forests, on low grounds.

Eurylaimus, Horsf.

Toes similar to those of the Manakins and the Rock Manakins; but the beak, as strong as that of the Tyrants, is enormously broad and depressed, the base even surpassing the width of the forehead. The point is a little hooked, and slightly emarginate on each side; the ridge is blunt.

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(1) *Pipra militaris*, Sh. Nat. Misc., 849;—*Pipra caudata*, Sh. Nat. Misc., 153, Spix, 6;—*Pipra filicauda*, Spix, 8;—*Pipra pareola*, Enl. 637, 2, and 303, 2;—*superba*, Pallas, Sp. I, pl. iii, f. 1;—*erythrocephala*, Enl. 34, 1;—*aureola*, 34, 3, and 302;—*rubrocapilla*, Col. 54, 3 or *cornuta*, Spix, 7, 2;—*coronata*, Sp. 7, 1, 2;—*serena*, Enl. 324, 2, and Vieill. Gal. 72;—*gutturalis*, 324, 1; *leucocapilla*, 34, 2;—*manacus*, 302, 1 and 303, 1;—*strigilata*, Pr. Max. Col. 54, 1, 2.

These birds inhabit the archipelago of India. The ground of their plumage is black, variegated with patches of bright colours, and they have something of the air of the Bucco, a genus of a very different order. They live near water, and feed on insects.(1) *See App. XIX of Am. Ed.*

FAMILY II.

FISSIROSTRES.

The Fissirostres form a family, numerically small, but very distinct from all others in the beak, which is short, broad, horizontally flattened, slightly hooked, unemarginate, and with an extended commissure, so that the opening of the mouth is very large, which enables them to swallow with ease the insects they capture while on the wing.

They are most nearly allied to the Flycatchers, and to the Procniæ in particular, whose beak only differs from theirs in being emarginate.

Their decidedly insectivorous regimen eminently qualifies them for birds of passage, which leave us in the winter.

They are separated, like the birds of prey, into two divisions, the diurnal and the nocturnal. The genus

Hirundo, Linn.

Or the Swallow, comprehends the diurnal species, all of which are remarkable for their dense plumage, extreme length of wing, and velocity of flight. Among them we distinguish,

Cypselus, Illiger.

Of all birds, these have the longest wings in proportion to their size, and the greatest powers of flight. Their tail is forked; their extremely short feet have this very peculiar character: the thumb is directed forward almost as much as the other toes, and the middle

(1) *Todus macrorhynchos*, Gm., Lath., Syn. II, pl. xxx and Col. 154, under the name of *Euryl. nasutus;—Euryl. javanus*, Horsf., and Col. 130 and 131, under the name of *Euryl. Horsfieldii;—Eur. cucullatus*, Tem. Col. 261; *Eur. Blainvillii*, Less. and Garn. Voy. de la Coquille, pl. xix, f. 2. The character of the beak is excessively developed in the *Eur. corydon*, Temm. Col. 297.

and external ones consist each of three phalanges like the internal one.

The shortness of their humerus, the breadth of its apophyses, their oval fourchette, their sternum not emarginate beneath, all indicate, even in the skeleton, their fitness for vigorous flight; but the shortness of their feet, together with the length of their wings, prevents them, when on the ground, from rising, and consequently they pass their lives, if I may so express it, in the air, pursuing in flocks, and with loud cries, their insect prey through the highest regions of the atmosphere. They nestle in holes of walls, or fissures in rocks, and climb along the smoothest surfaces with great rapidity.

The common species, *Hirundo apus*, L., Enl. 541, 1, is black, with a white throat.

That from high mountains, *Hirundo melba*, L.; Edw. 27; Vaill. Afr. 243; Vieill. Gal. 121, is larger, brown above, and white beneath, with a brown collar under the neck.(1)

Hirundo, Cuv.

The Swallows proper have the toes and sternum disposed like those of the Passerinæ generally. In some of them the feet are invested with feathers down to the nails; the thumb still exhibits a disposition to incline forward; the tail is forked, and of a moderate size.

H. urbica, L.; *Hirondelle de fenetre*, Enl. 542, 2. The Martin.) Black above; underneath, and the rump, white. The substantial nest it constructs of earth, at the angles of windows, under eaves of houses, &c. is well known to every one.(2)

Others have naked toes, and the forks of the tail very often extremely long.

H. rustica, Enl. 543, 1. (The Chimney Swallow.) Black above; forehead, eyebrows, and throat, red, all the remaining under part white. The name is derived from its usual place of residence.

H. riparia; Hirondelle de rivage; Enl. 453, 2. (The Sand Martin.) Above, and the breast brown; the throat, and underneath, white. It lays in holes along the banks of rivers. That

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(1) Add *Hir. sinensis;*—the *Martinet à croupe blanche*, Vaill. Afr. 244, 1?—the *Martinet velocifere*, Id. Ib. 244, 2?—the *Martinet à moustaches* (*Cyps. mystaceus*, Less. and Garn.), Voy. de la Coquille, No. 122;—the *M. coiffé* (*C. comatus*, T.), Col. 268;—the *M. longipenne* (*Hir. longipennis*, T.), Col. 83, 1. [Add *Cyps. pelagicus*, Wils. V, pl. xxxix, f. 1. *Am. Ed.*]

(2) Add *Hirundo cayennensis*, Enl. 725, 2;—*Hir. ludoviciana*, Nob. Enl. 725, 1, and Catesby, 1, 51—*Hir. montana;*—the same as the *rupestris*.

it becomes torpid during the winter, and even passes that season under water in the bottom of marshes, appears to be certain.

Among the Swallows foreign to Europe, we should remark,

Hir. esculenta, L. A very small species from the Archipelago of India, with a forked tail; brown above; beneath, and the tip of the tail, whitish; celebrated for its nest, composed of a whitish gelatine, arranged in layers, and constructed with a particular species of fucus which it previously grinds and macerates. The nutritious qualities attributed to these nests in China, have rendered them an important article in the commerce of that country.(1)

There are some Swallows in which the tail is nearly square,(2) and others where it is short, square, and the quills terminating in a point.(3)

Caprimulgus, Lin.(4)

The Goatsuckers have the same light, soft plumage, shaded with grey and brown, that characterizes the nocturnal birds. Their eyes are large; the commissure of the beak extending still higher up than that of the Swallow, and furnished with stiff mustachios, is capable of engulphing the largest insects, which are retained there by a glutinous saliva; the nostrils, formed like small tubes, are at its base. Their wings are long; their feet, short, with feathered tarsi,

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(1) Here come: *Hir. americana*, Wils., V, xxxviii, 1, 2, or *rufa*, Vieill., Am. 3;—another *Hir. rufa*, Enl. 724, 1;—*Hir. fulva*, Vieill. Am. 32;—*Hir. fasciata*, Enl. 724, 2;—*Hir. violacea*, Enl. 722, or *H. purpurea*, Wils., V, xxxix, 1, 2;—*Hir. chalybæa*, Enl. 454, 2;—*Hir. senegalensis*, Enl. 310;—*Hir. capensis*, Enl. 723, 2;—*Hir. indica*, Lath. Syn. II, pl. lvi;—*Hir. panayana*, Sonner. Voy. I, pl. lxxxvi;—*Hir. subis*, Edw., 120;—*Hir. ambrosiaca*, Briss., II, pl. lxv, fig. 4;—*Hir. tapera*, Ib., fig. 3;—*Hir. nigra*, Id. pl. lxvi, fig. 3;—*Hir. daurica*;—*Hirondelle à front roux*, Vaill. Afr. 245, 2;—*Hir. de marais*, Id. Ib. 246, 2;—*Hir. huppée*, Id. Ib. 247;—*Cyps. senex*, T. 397;—*Hir. fucata*, Tem., Col., 161, 1;—*Hir. jugularis*, Pr. Max., Col., 209, 2;—*Hir. javanica*, Lath. Col. 83, 2;—*Hir. melanolenca*, Pr. Max., Col. 209, 2;—*Hir. minuta*, Pr. Max., Col. Ib., 1;—*Hir. bicolor*, Vieill. Am. 31, or *H. viridis*, Wils., V, xxxviii, 3.

(2) *Hir. dominicencis*, Enl. 545, 1;—*Hir. torquata*, Enl. 723, 1;—*Hir. leucoptera*, Enl. 546, 1;—*Hir. francica*, Enl. 544, 2;—*Hir. borbonica*;—*H. americana*;—*Hir. fauve*, Vaill. Af. 246, 1.

(3) *Hir. acuta*, Enl. 544, 1;—*Cypselus giganteus*, Col. 364;—*Hir. albicollis*, Vieill., Galer. 120, or *Cyps. collaris*, Pr. Max., Col. 195.

(4) *Caprimulgus, Goatsucker, Ægothelas*, names which derive their origin from the whimsical idea entertained by the vulgar, of their sucking Goats and even Cows.

N.B. M. Vigors and Horsfield make a genus (Ægotheles,) of the *Caprimulgus Novæ-Hollandiæ*, Philip., Bot. B., 270.

and their toes united at base by a short membrane. The thumb itself is thus united to the internal toe, and can direct itself forwards; the middle nail is often dentated on its inner edge, and the external toe has but four phalanges, a conformation very rare among birds. Goatsuckers live solitarily, and never venture abroad, except at twilight, and in the night during fine weather. They hunt Phalenæ and other nocturnal insects, and lay a small number of eggs on the bare ground, without taking any pains in the construction of a nest. The rushing of the air into their immense mouth, while on the wing, produces a very peculiar humming sound. There is but one species in Europe,

Capr. europæus, L.; Enl. 193. (European Goatsucker.) Size of a Thrush; of an undulated greyish-brown, mottled with blackish brown; a whitish band reaching from the beak to the neck. It builds in the furze or long grass, and lays only two eggs.

America produces several of these birds with a round or square tail, one of which is as large as an Owl, *Caprim. grandis*, Enl. 325; and another, *C. vociferus*, Wils. V, xli, celebrated on account of its loud and peculiar cries in the spring of the year.(1) One of them is found in New Holland.

There are some also in Africa,(2) part of which have a pointed tail,(3) and others a forked one, an additional indication of the affinity between this genus and that of the Swallows.(4) There is even one in America, the forks of whose tail are longer than the body;(5) the middle nail of these fork-tailed species is not dentated.

One species, likewise from Africa, but with a round tail, is very remarkable for a feather twice the length of the body, which arises from near the carpus of each wing, and is barbed only near the end: the *Caprim. longipennis*, Shaw, Nat. Miscell., 265.

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(1) Add, *Capr. virginianus*, Edw., 63, or *americanus*, Wils. V. xl, 1, 2, which appears to me at any rate very nearly allied to the *guyanensis*, Enl. 733; it has been confounded with the *vociferus*;—*Capr. carolinensis*, Catesb., 8, Wils. V, liv, 2, a species very closely allied to that of Europe;—*C. jamaicensis*, Lath., Syn. II, pl. lvii;—*C. rufus*, Enl. 735;—*C. semitorquatus*, Enl. 734;—*C. cayenensis*, Enl. 760;—*C. acutus*, Enl. 752;—*C. Nattereri*, Col. 107;—*C. diurnus*, Pr. Max. Col. 182;—*C. mystacalis*, Tem.

(2) *C. infuscatus*, Ruppel., pl. vi;—*C. isabellinus*, T. Col. 379;—*C. eximius*, Ruppel. Col. 398.

(3) *C. climacurus*, Vieill. Galer. 122.

(4) *Capr. furcatus*, Cuv. Vaill. Afr. 47;—*C. pectoralis*, Id. Ib. 94.

(5) *C. psalurus*, Tem. Col. 117, 151.

Podargus, Cuv.

The form, colour, and habits of the Goatsuckers; but the beak is stouter, and there are neither membranes between the toes, nor is the middle nail dentated.(1)

P. Cuvieri; P. cendré; Vieill. Galer. 123. Variegated with ash, whitish and blackish colours; size of a Rook.

P. javanensis, Horsf. Jav. Red, varied with brown; a white band along the scapulars.

P. cornutus, T., Col. 159. Red, varied with white; large tufts of feathers at the ears.

FAMILY III.

CONIROSTRES.

The Conirostres comprehend genera with a strong beak, more or less conical, and unemarginate; the stronger and thicker their beak, the more exclusively is grain their food. The first genus to be distinguished is,

Alauda, Lin.

The Larks are known by the nail of their thumb, which is straight, strong, and much longer than the others.(2) They are granivorous birds, and pulverators. They build on the ground, and generally keep there.

The beak of the greater number is straight, moderately stout and pointed.

Al. arvensis; Alouette des champs, Enl. 368, 1; Naum. 100, 1. (The Sky Lark.) Universally known by its perpendicular mode of soaring, accompanied by its varied and powerful song. It is brown above; whitish underneath; spotted throughout, with a deeper shade of brown; the two external quills of the tail white outside.

Al. cristata; *Le Cochevis*, Enl. 503, 1; Naum. 99, 1. (The Crested Lark.) Nearly the same size and plumage; but it has the power of erecting the feathers on the head into a tuft; not

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(1) M. Vigors considers this subgenus as connecting *Caprimulgus* with *Ulula*.

(2) This character is more or less marked in Budytes, Alauda, Anthus, and in the *Emberiza nivalis*.

so common as the preceding, and frequents the vicinity of villages, &c.

Al. arborea; Al. nemorosa; Cujelier; Enl. 503, 2; Naum. 100, 2. (The Woodlark.) A small, but not so strongly marked tuft; it is smaller, and is otherwise distinguished by a whitish streak round the head, and a white line on the little coverts; prefers the heaths in the interior of the forests.(1) We sometimes see in Europe,

Al. alpestris, *Al. flava*, and *Al. sibirica*, Gm.; *Alouette à haussecol noir*, Enl. 652, 2; Naum. 99, 2, 3; Wils. I, v, 4. From Siberia and North America; forehead, cheeks, and throat yellow, with black streaks; a large, black, transverse spot on top of the breast; a small pointed tuft behind each ear of the male.

Some of them have so stout a beak, that, with respect to it, we might approximate them to the Sparrows. Such are

Al. calandra; La Calandre; Enl. 363, 2; Naum. 98, 1. The largest of the European species; brown above; white beneath; a large blackish spot on the breast of the male. From the south of Europe, and the deserts of Asia.

Al. tartarica, and *mutabilis*, and *Tanagra sibirica*, Gm.—*Alouette de Tartarie;* Sparm. Mus. Carls. pl. xix; Vieill. Galer. 106. The plumage of the adult black, undulated above with grey. It occasionally wanders into Europe.(2)

In others, the beak is elongated, slightly compressed, and arcuated, which connects them with Upupa and Promerops. Such is

Al. africana, Gm.; *Le Sirli;* Enl. 712; Vieill. Galer. 159. Common in all the sandy plains of Africa; its plumage scarcely differs from that of the Arvensis.(3)

Parus, Lin.

The Titmouse has a slender, short, conical and straight beak, furnished with little hairs at the base, and the nostrils concealed among the feathers. It is a genus of very active little birds, which are continually flitting and climbing from branch to branch, suspending

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(1) Add, of European species, the *Girole* (*Al. italica*);—the *Coquillade* (*Al. undata*), Enl. 662; *Al. brachydactyla*, Naum. 98, 2. Species foreign to Europe, the *Bateleuse*, Vaill. Afr. 194;—the *Dos roux*, Id. 197;—the *Calotte rousse*, Id., 198.

N.B. The *Al. magna*, Catesb., I, 33, is the *Sturnus ludovicianus*.

(2) Add, the *Tracal*, Vaill. Afr. pl. cxci;—the *Al. gros bec*, Id., pl., cxciii.

(3) Add, *Al. bifasciata*, Rupp., pl., 5; Col., 393.

N.B. Swainson separates from Alauda the *Bateleur* of Vaill. pl. 194, under the name of Brachonyx; his *Sentinelle*, 195, under that of Macronyx; and of my division with long beaks he makes his Certhilauda.

themselves therefrom in all sorts of positions, rending apart the seeds on which they feed, devouring insects wherever they see them, and not sparing even small birds when they happen to find them sick, and are able to put an end to them. They lay up stores of seeds, build in the holes of old trees, and lay more eggs than any of the Passerinæ. There are six species of Parus, properly so called, in France.

P. major, L.; *La Charbonniere;* Enl. 3, 1; Naum. 94, 1. (The Great Titmouse.) An olive colour above; yellow beneath; the head, as well as a longitudinal band on the breast, black; a white triangle on each cheek. Very common in gardens, &c.

P. ater, L.; *La petite charbonniere;* Frisch, I, pl. xiii, 2; Naum. 94, 2. Smaller than the preceding; an ash colour in place of the olive, and whitish instead of the yellow. Prefers the great pine forests.

P. palustris, L.; *La Nonnette;* Enl. 3, 3; Naum. 94, 4. (The Marsh Titmouse.) Ash coloured above; whitish beneath; a black calotte.

P. cæruleus, L.; *La M. à tête bleue;* Enl. 3, 2; Naum. 95, 1, 2. (The Blue-Headed Titmouse.) Olive above; yellowish beneath; top of the head a fine blue; the cheek white, surrounded with black; forehead white. A pretty little bird, very common in the underwood.

P. cristatus, L.; *Le M. huppé*, Enl. 502, 2. (The Crested Titmouse.) Brownish above; whitish beneath; throat and circumference of the cheek, black; a little tuft mottled with black and white.

P. caudatus, L.; *Le M. à longue queue*, Enl. 502, 3; Naum. 95, 4, 5, 6. (The Long-tailed Titmouse.) Black above; wing-coverts, brown; upper part of the head and all beneath, white; tail longer than the body. It builds its nest on the limbs of small trees, and roofs it over.(1) The

(1) Several species of the European Titmouse are also represented in the work of M. Roux, pl. cxvii—cxxiv. Add, *Parus bicolor* (Catesb. I, 57);—*P. cyanus* (Nov. Comm. Petrop., xiv, pl. xiii, fig. 1, and 23, fig. 2) and *P. sælbyensis* (Sparm. M. Carls., pl. xxv) which appear to Bechstein to be the two sexes of one same species. Vieill. Gal. 68; Naum. 95, 6;—*P. atricapillus* (Briss. iii, pl. xxix, fig. 1);—*P. sibiricus*, (Enl. 708, fig. 3) and *P. palustris*, B. (Enl. 502, 1) which are three varieties, or very closely allied species;—*P. atriceps*, Horsf.; Col. 287, 2.

The *Parus malabaricus* (Sonner. Voy. II, pl. cx, 1) and the *coccineus* (Sparm. Mus. Carls., 48, 49), *P. furcatus*, Col. 287, 1, are Saxicolæ or Flycatchers, neighbours to the *Oranor*, Vaill., the *Mot. ruticilla*, L., and the *Turdus speciosus*, Lath. It may be observed, that in every instance where the characters of a bird are not well defined, it has been bandied about from one genus to another.

Bearded Titmouse

Differs from the true ones in the upper mandible of the beak, the end of which is slightly bent upon the other. There is but one in France.

Par. biarmicus, L.; *La Moustache;* Enl. 618, 1 and 2; Vieill. 69; Naum. 96. (The Bearded Titmouse.) Fawn coloured; head of the male cinereous, with a black band which surrounds the eye, terminating in a point behind. It builds among rushes, and is found, though rarely, throughout the whole of the eastern continent.

Remiz.

The beak more slender and pointed than that of the common Titmouse, and there is generally more art displayed in the construction of its nest. There is but one found in France.

Par. pendulinus; Le Remiz; Enl. 618, 3; Vieill. 70; Naum. 79. Cinereous; wings and tail brown; a black band on the forehead, which, in the male, is continued to behind the eyes. This little bird, inhabiting the south and east of Europe, is celebrated for the pretty, purse-shaped nest, formed of the down from the poplar and willow, and lined with feathers, which it suspends to the flexile branches of aquatic trees.(1)

Emberiza, Lin.

The Buntings have a very distinct character in their conical, short and straight beak, the upper mandible of which is narrow, sinks into the lower, and has a projecting, hard tubercle on the palate. They are granivorous, and unsuspicious birds, which run into every snare that is laid for them.

E. citrinella, L.; *Bruant commun;* Enl. 30, 1; Naum. 102, 1, 2. (The Yellow Bunting.) Fawn coloured back, spotted with black; head and all the under part of the body yellow; the inner edge of the two external quills of the tail, white. It builds in hedges, and approaches our dwellings in winter, in numberless flocks, along with the Finches, &c.

E. cia, L.; *Bruant fou;* Enl. 30, 2; Naum. 104, 1, 2. (The Foolish Bunting.) Differs from the preceding, in being reddish-

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(1) *Parus narbonensis* (Enl. 708, 1) appears to be the female of the pendulinus; add, the *Parus capensis,* (Sonner. Voy. II, pl. cxii,) whose nest, made of cotton and shaped like a bottle, has a kind of spout on the edge of the neck, for the male to perch on.

grey beneath, and having the sides of the head whitish, surrounded by black lines, forming a triangle. From mountainous districts.(1)

E. cirlus, L.; *Bruant des haies*; Enl. 653; Naum. 102, 3, 4. (The Hedge Bunting.) Throat black; sides of the head yellow. Builds in the underwood on the borders of fields.(2)

E. schæniclus, L.; *B. de roseaux*; Enl. 247, 2; Naum. 105. (The Reed Bunting.) A black calotte on the head; spots of the same colour on the breast; back, red. Builds at the foot of a bush on the brink of a stream, &c.(3) The largest species in France is,

E. miliaria, L.; *Le Proyer;* Enl. 233; Naum. 101, 1. (The Common Bunting.) Brownish-grey, every where spotted with a deeper brown. Builds in grass, among grain, &c. The most celebrated for the flavour of its flesh is,

E. hortulana, L.; Enl. 247, 1; Naum. 103. (The Ortolan.) The back, olive-brown; throat yellowish; the inner side of the two external feathers of the tail, white. Builds in hedges; is very fat and common in autumn.(4)

E. melanocephala, Scop.; Naum. 101, 2; *Fring. crocea*, Vieill., Ois. Tab. 27. (The Black-headed Bunting.) Fawn-colour above; yellow underneath; black head. Is sometimes seen in the south of Europe. Also,

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(1) The *Emb. lotharingica*, Enl. 511, 1, is the same.

(2) The *Emb. passerina* is also referred to it; and perhaps the *Emb. provincialis*, Enl. 656, 1, and *lesbia*, Ib. 2, are only accidental varieties of the same. See Roux, p. 176 and 178.

(3) M. Wolf thinks that the *Emb. chlorocephala*, and the *Emb. badensis*, should be united with it.

(4) The *Emb. melbensis*, Sparm. Mus. Carls., 1, 21, is merely a young Ortolan.

Notwithstanding all the synonymes we have pointed out, we are still compelled to remove from this genus the *Emb. brumalis*, which is the same bird as the *Fringill. citrinella*, Enl. 658, 2;—*E. rubra*, the same as *Fring. erythrocephala*, Enl. 665, 1, 2;—all the widows, as I shall hereafter remark;—*Emb. quadricolor*, Enl. 101, 2;—*Emb. cyanopis*, Briss. III, pl. viii, fig. 4;—*Emb. cærulea*, Id. Ib. xiv, 2, the same as *cyanella*, Sparm. Carls. II, 42, 43, which are three cross-beaks;—*Emb. quelca*, Enl. 223, 1;—*Emb. capensis*, Enl. 158 and 564;—*Emb. borbonica*, Enl. 321, 2;—*Emb. brasiliensis*, Ib. 1, which are four Finches;—*Emb. ciris*, Enl. 158, which is a Linnet;—and, finally, *Emb. oryzivora*, Enl. 388, which has the beak of a Linnet, independently of the species I have not been able to examine. But we must certainly place in the genus Emberiza, the *Emb. gubernator*, T., Col. 63, the same as the *Emb. cristatella*, Vieill. Gal. 67;—*Emb. striolata*, Ruppel. Av., pl. 10, a;—*Emb. cæsia*, Id. Ib., 6;—The *Tanagra cristatella*, *graminea*, *ruficollis*, Spix, 53, are also Buntings.

The Emberizoides, Tem., Col. 114, appear to be long and taper-tailed (etagé) buntings whose beak approaches somewhat to that of the Finches.

E. pithyornis, Pall.; Naum. 104, 3. (The Pine Bunting.) The throat, and a streak on the side of the head, red chesnut colour.

M. Meyer distinguishes those buntings which have the nail of the thumb elongated like that of the Lark, by the name of PLECTROPHANES. Such is

Emb. nivalis, L.; *Bruant de neige;* Enl. 511; Naum. 106 and 107. (The Snow Bunting.) Known by a broad, longitudinal, white band on the wing. A northern bird, which becomes nearly all white in winter.(1) To this we should add,

Fring. laponica, Gm. or *calcarata*, Pall. Fr. Tr. III, pl. 1, 1; *Grand Montain* of Buff.; Naum. 108. (The Lapland Bunting.) Spotted with black, on a fawn coloured ground, the throat and upper part of the breast of the male, black. Inhabits the same countries as the preceding, is sometimes, but rarely, seen in France during the winter.

FRINGILLA, Lin.

The Sparrows have a conical beak, more or less thick at base; but its commissure is not angular. They feed generally on grain, and are for the most part voracious and noxious. We subdivide them as follows:

PLOCEUS, Cuv.(2)

The Weavers are provided with such a large beak, that they have been partly classed with the Cassici; its straight commissure distinguishes them from the latter. The upper mandible is moreover slightly convex. They are found in both worlds, and most of those in the eastern continent are very skilful in the construction of their nest, which they form of intertwined blades of grass, from which circumstance they receive their name. Such is

Loxia philippina, L.; *Toucnam-Courvi des Philippines;* Enl. 135. Yellow, spotted with brown; black throat. Its nest, which is a suspended sphere, is pierced by a vertical canal, opening underneath, which communicates with a cavity on the side in which the young ones are lodged.(3)

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(1) The *Emb. montana*, and the *Emb. mustelina*, are merely different states of the Snow Bunting.

(2) Πλοκευς, Weaver,—Vieill. has adopted this name and genus, pl. lxxxiv.

N.B. The EMBERIZOIDES of Temm. have become the TARDIVOLA of Swainson, and the *Emb. oryzivora* forms the genus DOLICHONYX of the same naturalist.

(3) Add, the *Capmore*, Buff. (*Oriolus textor*, Gm.), Enl. 375 and 376;—*Fringilla erythrocephala*, Enl. 665; Vieill., Ois. ch., 28;—the pretended *Tangara de malimbe*,

Some of them form a single mass of a great number of individual nests, which contains several distinct apartments. Such is

Loxia socia, Lath.; Paters. Voy. pl. xix. (The Republican.) An olive brown; yellowish beneath; head and quills brown or blackish.

Among those of the western continent, we may remark,

Oriolus niger, Or. oryzivorus, Corvus surinamensis, Gm.; *Maugeur de riz; Cassique noir*, &c.; Enl. 534; Brown, Ill. X; Wils. III, xxi, 4, which, in immense flocks, devastates the fields of several of the warmer portions of America. Its colour is a changeable black, reflecting all the magnificent tints of burnished steel.(1)

Daud. An. Mus. I, p. 148, pl. x, or *Malimbe huppé*, Vieill. Ois. ch. 42 and 43;—the *Malimbe orangé*, Id. 44;—*Malimbe à gorge noir*, Id. 45;—the *Tiss. à front d'or*, (*Ploc. aurifrons*, Tem., Col. 175, 176);—the *Baglafecht* (*Lox. abyssinica*);—the *Nélicourvi* (*Lox. pensilis*), Sonn. Voy. II, pl. cix;—the *Worabee* (*Fring. abyssinica*, Gm.), Vieill. Ois. 28;—*Fring. erythrocephala*, Gm., Vieill. Ib., 28. We might distinguish the *Ploc. alecto*, Tem. Col., 446, which has an inflation at the base of the beak.

(1) Nomenclators have not yet succeeded in putting in order the black birds of America more or less nearly allied to the Cassici, for the want of sufficiently detailed descriptions. We think it right to indicate the principal ones here, and at the same time to point out such of their synonymes as appear to be the most clearly ascertained.

1. The *Cassique noir à mantelet*, as above.

2. The bird mentioned above, well drawn, but painted without its reflected tints, Enl. 534, and quoted under *Oriolus niger*. The *Oriolus ludovicianus*, Enl. 646, is only an albino variety of the same. It is evidently the *Corvus surinamensis*, Brown, III, pl. x. The *Little Choucas of Jamaica*, Sloane, Jam. II, 299, pl. cclvii, 1, quoted by Pennant as *Gracula barita* and as *quiscala*, is this same bird again. On the other hand, it is impossible to doubt that Latham had it before him when he described his *Oriolus oryzivorus*.

3. The true *Carouge noir*, with purple changes, beak rather short, but very straight, given as a Tanager, Enl. 710, and from which the *Tan. bonariensis* has been made; but this figure really represents the *Oriolus minor*. The fig. 2, Enl. 606, is given, but erroneously, for the female, which has a very different appearance.

4. A true *Icterus* of a deep black with violet reflections, sharp-pointed and somewhat arcuated beak, whose tail is hollowed out like a boat. It is the *Boat-tailed Grakle* of Penn. and Latham, which both those gentlemen consider as synonymous with the *Gracula barita*, and yet it certainly is the bird of Catesb. pl. 12, of which Lin. made his *Gracula quiscala;* but Catesby has given a bad drawing of the beak.

5. A black bird with violet and green reflections, somewhat cuneiform, (etagée) tail, and the beak of an Icterus, but more arcuated near the point, &c.

N.B. The bird quoted from Wils., III, xxi, 4, is not a Ploceus. It is the *Quiscalus versicolor*, Bonap., or the *Gracula quiscala*, L. *Am. Ed.*

Pyrgita, Cuv.(1)

In the Sparrows proper the beak is shorter than in the preceding birds, conical, and merely a little convex near the point.

Fringilla domestica, Enl. 6, 1; Naum. 115. (The Common Sparrow.) Builds in holes of walls, and infests inhabited places by its audacity and voracity. Brown, spotted with black above, grey underneath; a whitish band on the wing; sides of the calotte red in the male; his throat black.

There is a species, or a variety, in Italy, of which the male's head is entirely chesnut colour—*Fr. cisalpina*, Tem.; *Fr. Italiæ*, Vieill. Galer. 68. The black on the throat sometimes extends to the breast; it is then the *Fr. hispaniolensis.*

Fr. montana; Le Friquet; Enl. 267, 1; Naum. 116, 1, 2. The Mountain Linnet remains further from our habitations. It has two white bands on the wing, a red calotte and the side of the head white with a black spot.(2)

Fringilla, Cuv.

The beak of the Finches is somewhat less arcuated than that of the Sparrows, a little stronger and longer than in the Linnets. Their manners are more lively, and their song more varied than those of the former. There are three species in France.

Fring. cælebs, L.; *Pinçon ordinaire;* Enl. 54, 1; Naum. 118. (The Chaffinch.) Brown above; beneath, a vinous-red in the male, greyish in the female; two white bands on the wing; some white on the sides of the tail. Feeds on all sorts of grain and builds indiscriminately on all kinds of trees.

Fring. montifringilla, L.; *Pinçon de montagne;* Enl. 54, 2; Naum. 119. (The Mountain Finch.) Black, mottled with fawn colour above; fawn coloured breast; under part of the wing of a beautiful lemon. This bird, which varies greatly, builds in the thickest forests, and never visits the plains till winter.

Fring. nivalis, L.; *Niverolle;* Briss. III, xv, 1; Naum. 117.

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(1) *Pyrgita*, the Greek name for the Domestic Finch.

(2) The *Hambouvreux*, Buff. (*Loxia hamburgia*, Gm.) is merely the *Friquet*, disfigured by Albin., Ois. III, pl. 24.

We should add to the ordinary Sparrows, the birds that have been scattered about by naturalists as follows, viz. *Fringilla arcuata*, Enl. 230, fig. 1, where it is much too red; its true tints are those of the Sparrows;—*Fr. crucigera*, Tem. 269;—*Emberiza capensis*, c, Enl. 389, 2 and g, Enl. 664, 2;—*Tanagra silens*, Enl. 742, of which Vieill. has made his genus Arremon, Gal. 78;—*Fring. elegans*, Enl. 205, 1, Vieill. Gal. 64;—Le pape, *Emberiza ciris*, Enl. 159, which forms the genus Passerina, Vieill., Gal. 66;—*Loxia oryx*, Enl. 6, 2;—*Lox. ignicolor*, Vieill. Ois. Chant.; 59;—*Loxia dominicana*, Enl. 55, 2, and the other species, Enl. 103;—*Fringilla*

(The Snow Finch.) Brown, mottled with a paler tint of the same colour above; whitish beneath; head, ash coloured; coverts of the wings, and nearly all the secondary quills, white. The throat of the male, black. From the rocks of the upper Alps, where it only descends in the middle of winter to the lower mountains. [*See App. XX of Am. Ed.*]

Carduelis, Cuv.

The Linnets and Goldfinches have an exactly conical beak without the least convex protuberance at any point. They live on grain. Those which have a little longer and more pointed beak are styled Goldfinches.

Fring. carduelis, L.; Enl. 4; Naum. 124, 1, 2. (The Common Goldfinch.) One of the prettiest birds in Europe. Brown above, whitish beneath; the mask of a beautiful red; a fine yellow spot on the cheek, &c. It is also very docile, quickly learns to sing and to play all kinds of tricks.(1)

Linaria, Bechst.

The Linnets also have an exactly conical beak, but it is shorter and more obtuse than in the Goldfinches. They feed on seeds of plants; those of flax and hemp in particular.

There are some species in Europe, brown, tinted with red, which are more peculiarly styled Linnets. The quantity of red in the young birds and females is very various, and sometimes is totally wanting. The beak of the first is almost as pointed as that of the Goldfinch. It is,

Fr. linaria, L.; *Le Sisserin;* Enl. 485, 2; Vieill. Gal. 65; Naum. 126. (The Redpoll.) Brown, spotted with black above; two white bands across the wing; black throat; top of the head as well as the breast of the adult male, red; the rump is sometimes of the same colour. A northern bird, of which it is supposed two races have lately been detected, a large and a small one.(2)

Fr. cannabina, L., Enl. 485, 1; Naum. 121. (The Linnet.) Back, fawn coloured brown; quills of the wing and tail, black

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cristata, Enl. 181;—the *Dioch* (*Emb. quelea*) Vieill. Ois. Chant. 23;—the *Dioch rose*, Id., 24;—*Lox. capensis*. The latter begins to approach the Grosbeaks.

To these should be added, *Pyr. orythrophthalma*, Wils. II, pl. x, f. 5;—*P. iliaca*, Wils. III, p. xxii, f. xiv. *Am. Ed.*

(1) Add, *Fr. psittacea*, Lath., Syn. II, p. 48;—*Fr. melba*, Edw., 128 and 272;—*Fr. coccinea*, Vieill. Ois. ch. pl. xxxi;—*Fr. leucocephala*, Lath. Id. 26;—*Fr. magellanica*, Id. 30.

(2) See the Mem. de M. Vieillot, Acad. de Turin, tom. xxiii, p. 193, et seq.

edged with white; whitish underneath; a fine red on the head and breast of the old male; beak, grey. Builds among the vines, bushes, &c.

An intermediate species, most nearly allied however to the second, *Fring. montium*, Gm., Naum. 122, is occasionally seen from the North. Its beak is yellow, and there is some red on the rump of the male.

There are other species, more or less greenish, which are called by the French *Serins* or *Tarins*. The

Fring. spinus, L.; *Tarin commun;* Enl. 485, 3; Naum. 125. (The Siskin.) Also has a beak more like that of the Goldfinch, and is even similar in many points to the Redpoll. It is of an olive colour above; yellow beneath; calotte, wings and tail, black; two yellow bands on the wing. It builds on the very summits of the tallest pines.

The other species have the shorter beak of the Linnet.

Fring. citrinella, L.; *Le Venturon;* Enl. 658, 2; Vieill. Gal. 62; Naum. 124, 3, 4. Olive above; yellowish beneath; back of the head and neck ash coloured.

Fring. serinus, L.; *Le Cini;* Enl. 658, 1; Naum. 123. Olive above; yellowish beneath; spotted with brown; a yellow band on the wing. Two birds from the mountains of the south of Europe, about the size of the *Fr. spinus.*

Fring. canaria, L. Enl. 202, 1. (The Canary Bird.) Is larger, and the facility with which it breeds, in a state of confinement, together with its melodious and powerful song, have disseminated it every where, and caused it to vary so much in colour, that it is difficult to ascertain its original hue. It mixes with most of the other species of this genus.(1)

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(1) Among the birds foreign to Europe, which cannot be distinguished from the Linnets by any generic character, we place, *Fring. lepida;—Fr. tristis*, Enl. 202, 2;—*Fr. ictera*, Enl. 364;—*Fr. nitens*, Enl. 224;—*F. senegalla*, Vaill. Ois. ch. pl. ix;—*F. amandava*, Enl. 115, 2 and 3;—*F. granatina*, Enl. 109, 3;—*F. bengalus;—F. angolensis*, Enl. 115, 1;—*Carduclis cucullata*, Swains. Zool. Ill. There are other species also, called *astrils, bengalis* and *senegallis*, in the work of Vieillot, entitled Ois. chant. de la zone torride, such as the *Fr. bicolor*, pl. ix;—*Fr. tricolor*, pl. xx;—*cinerea*, 6;—*cærulescens*, 8;—*melpoda*, 7;—*viridis*, 4;—*erythronotos*, 14;—*quinticolor*, 15;—*rubriventris*, 13;—*frontalis* or *Lox. frontalis*, L. 16;—*F. guttata*, 3;—add *Fring. melanotis*, Temm. Col. 151, 1;—*Fr. sanguinolenta*, Ib. 2;—*Fr. polyzona*, Ib. 3;—*Fr. otoleucus*, Tem. Col. 269, 2, 3;—*Fr. simplex*, Lichtenst. Col. 358;—*Fr. lutea*, Col. 365;—*Fr. ornata*, Pr. Max. Col. 208. The pretended *Emberiza oryzivora*, Enl. 388, has also the same beak; but the stiff and pointed quills of the tail distinguish it.

See also the numerous Finches described by M. Ch. Bonaparte, Ann. of New York Lyc. II, December 1826, p. 106, et seq. [*See App. XXI of Am. Ed.*]

Vidua, Cuv.(1)

The Widows, as they are termed, are birds of Africa and India, which have the beak of a Linnet, sometimes slightly inflated at the base, and distinguished by having some of the quills of the tail, or of its upper coverts, excessively elongated in the males.(2)

There is a gradual transition, and without any assignable interval, from the Linnets to,(3)

Coccothraustes, Cuv.

Or the Grosbeaks, whose exactly conical beak is only distinguished by its excessive size.

Loxia coccothraustes, L., Enl. 99 and 100; Naum. 114. (The Common Grosbeak.) Is one of those that are most truly worthy of the name. Its enormous beak is yellowish; back and calotte brown; rest of the plumage greyish; throat and quills of the wings, black; a white band on the wings. It inhabits the moun-

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(1) It is not easy to see why Linnæus and Gmelin arranged them with the Buntings, by the names of *Emberiza regia*, (Enl. 8, 1);—*Emb. serena*, (Ib., 2);—*Emb. paradisea* (Enl. 194);—*Emb. panayensis* (Enl. 647);—*Emb. longicauda* (Enl. 635). Add, *Fringilla superciliosa*, Vieill. Gal. 61. If we do not leave the Widows with the Linnets, there is no other place for them exeept among the Grosbeaks.

(2) In the *Veuve à épaulettes* (*V. longicauda*) the coverts only are elongated; in the others, it is the quills. N.B. The *Emb. principalis*, (Edw. 270) and the *Emb. vidua* (Aldrow. Orni. II, 565) appear to me to be the same bird in different states of plumage. The *Emb. psittacea*, Seb. I, pl. lxvi, fig. 5, is not very authentic. The *angolensis*, Salern. Orni. 277; the *Veuve chrysoptére*, Vieill. Ois. ch. pl. xli, and the *Lox. macroura*, Enl. 283, 1, which, perhaps, do not differ from it, are not Widows, but eommon Grosbeaks.

(3) This transition is effeeted, in the speeies I have been able to examine, in the following order, the beak always increasing in size: *Loxia quadricolor*, (Ember., Lin.) 101, 2, the same as the *Gros bec longicone*, Tem. Col.;—*L. sanguinirostris*, Enl. 183, 2;—*L. molucca*, Enl. 139, 2;—*L. variegata*, Vieill. 51;—*L. punctulata*, Ib. 1;—*L. maja*, Enl. 109, 1;—*L. striata*, Enl. 153, 1;—*L. nitida*, Vieill. 50;—*L. malacca*, Enl. 139, 3;—*L. astrild.*, Enl. 157, 2;—*L. bella*, Vieill. 55;—*L. constans*, Id. 57;—*L oryzivora*, Enl. 152, 1;—*L. fuscata*, Vieill. pl. lxii;—*L. atricapilla*, Id., 53;—*L. nigra*, Catesb. 1, 68; Vieill. Gal. 57;—*L. brasiliana*, Enl. 309, 1;—*L. petronia* (*Fring. petronia*, L.) Enl. 255;—*L. chloris*, Enl. 267, 2;—*L. hæmatina*, Vieill. pl. lxvii, where the beak is too slender; *L. guttata*, Id. 68, is a variety of the same;—*L. quinticolor*, Id. 54;—*L. fasciata*, Brown, Ill., xxvii;—*L. madagascariensis*, Enl. 143, 2;—*L. cærulea*;—*L. cardinalis*, Enl. 37;—*L. melanura*;—*L. coccothraustes*, Enl. 89 and 100;—*L. ostrina*, Vieill. Ois. ch. 48, Gal. 60;—*L. rosea*, Vieill., pl. lxiii.

Add, *L. vespertina*, Bonap. II, pl. xiv, f. 1;—*L. ludoviciana*, Wils. II, pl. xvii, f. 1;—*L. cærulea*, Wils., III, pl. xxiv, f. vi;—*L. purpurea*, Wils. I, pl. vii, f. 4. *Am. Edit.*

tain forests, builds upon the beech, and eats almonds and all sorts of fruits.

There are two species with smaller beaks in Europe.

Loxia chloris, L.; *Le Verdier;* Enl. 672, 2; Naum. 120. (The Green Grosbeak). Greenish above; yellowish beneath; external edge of the tail, yellow. Inhabits the underwood, &c., and eats all sorts of seeds.

Fring. petronia, L.; *La Soulcie*; Enl. 225; Naum. 116, 3, 4. (The Ring Finch.) Which is commonly classed with the Finches, whose colours it bears; but independently of its great beak, a whitish line round the head, and a yellowish spot on the breast, afford an evident mark of distinction.(1)

There are some species that should be distinguished from the Grosbeaks.

Pitylus, Cuv.

The beak quite as large, slightly compressed, arcuated above, and sometimes a salient angle on the middle of the edge of the upper jaw.(2)

Naturalists have long separated from them,

Pyrrhula,

The Bullfinches, which have a rounded, inflated beak, arched in every direction. There is one in France.

Loxia pyrrhula, L.; Enl. 145; Vieill. Gal. 56; Naum. 111. (The Common Bullfinch.) Cinereous above; red beneath; calotte black; reddish grey superseding the red in the female; builds on various trees, and among the bushes along the road. It is naturally a sweet songster, is easily tamed, and may be taught to speak. There is a race of them known, a third larger.(3)

Loxia, Briss.(4)

The Crossbills have a compressed beak, and the two mandibles so strongly curved, that their points cross each other, sometimes on

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(1) It is very evident, that the *petronia* is not less a Grosbeak than the *chloris*.

(2) Such are *Lox. grossa*, Enl. 154;—*L. canadanensis*, Enl. 152, 2;—*L. erytromelas*, Lath. II, pl. xlvii, and Vieill. Gal. 59;—*L. portoricensis*, Daud. Ornith. II, pl. xxix, or *Pyrrhula auranticollis*, Vieill. Gal. 55.

(3) Add, *Lox. lineola*, Enl. 319, 1;—*M. minuta*, Ib. 2;—*L. collaria*, Enl. 393, 3;—*L. sibirica*, Falk. Voy. III, pl. xxviii;—*Pyr. cinercola*, Tem. Col. II, 1;—*P. falcirostris*, Ib. 2;—*P. orthaginea*, T. Col. 400;—*P. mysia*, Vieill., Ois. ch. pl. xlvi, and the pl. lix and lx of Spix. [Add. *P. frontalis*, Bon. I, p. vi, f. 1, 2. *Am. Ed.*]

(4) *Loxia* from λοξος (*curve*) the name invented for this bird by Conrad Gesner. Linnæus applied it to the Grosbeaks generally.

one side, sometimes on the other. This singular beak enables them to tear out the seeds from under the scales of the pine-cones.

The European species is very common wherever there are evergreen trees; it is,

Loxia curvirostra, L., Enl. 218. (The Crossbill.) The plumage of the young male is of a vivid red, with brown wings; that of the adult, and of the female, is greenish above, yellowish beneath. Two races of them, also, are known, which differ as to size, and even, as it is said, in their notes, and in the form of the beak, *Lox. curvirostra*, Naum. 110, and *Lox. pytiopsittacus*, Bechst., Naum. 109.(1)

We cannot remove from the Bullfinches and the Crossbills

Corythus, Cuv.(2)

The point of whose completely arched beak curves over the lower mandible. The most known species,

Loxia enucleator, L.; Enl. 135, 1; or better, Edw. 123, 124; Vieill. Gal. 53; Naum. 112. The Pine Grosbeak inhabits the north of both continents, and lives in the same way as the Crossbill. It is red, or reddish, the feathers of the tail and wings black edged with white.(3)

The north of the globe produces neighbouring species of equal beauty as to colour, individuals of which sometimes find their way into Germany.(4)

Colius, Gm.(5)

The Colies also approximate considerably to the preceding birds. Their beak is short, thick, conical, and somewhat compressed, its two mandibles being arcuated, but without extending beyond each other; the quills of their tail are cuneiform, and very long; their thumb, as in Cypselus, is capable of being directed forwards like the other toes; their fine and silky feathers are generally cinereous. They inhabit Africa and India, climb something in the manner of

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(1) Add *Lox. leucoptera*, Lath. Vieill. Gal. 53, and Wils. Am. Ornith.

(2) *Corythus*, Greek name of an unknown bird. Vieillot has changed this name into that of Strobiliphaga.

(3) *Loxia flamingo*, (Sparm. Mus. Carl. pl. xvii,) appears to me to be a mere albino variety of the *enucleator*. The *Lox. psittacea* of the Sandwich Islands, Lath. Syn. II, pl. xlii, or Psittacirostra *icterocephala*, Temm. Col. 457, appears to differ from Corythus only in a little greater prolongation of the curved point of the beak.

(4) *Lox. erythrina*, Pall. or *Fringilla flammea*, L., Naum. 113, 1, 2;—*Lox. rosea*, Pall. Naum. 113, 3;—*Fr. purpurea*, Wils. I, vii, 4 ?

(5) Κολοιος, the Greek name of a small species of Crow.

Parrots, live in flocks, build many of their nests on the same bush, and sleep suspended to its branches in crowds, with the head downwards. They feed on fruit.(1)

Here also come the

Buphaga, Briss.

The Beef-eaters form a small genus in which the beak is of a moderate length, cylindrical at the beginning, and inflated (both mandibles) near the end, which terminates in a blunt point. They use it to compress the skin of cattle in order to force out the larvæ of the Œstrus lodged in it, on which they feed.

One species only is known, and that is from Africa; brownish, with a moderate sized cuneiform tail; as large as a Thrush. *Buphaga africana*, Enl. 293; Vaill. Afr. pl. 97; Vieill. Gal.

Cassicus, Cuv.

A large and exactly conical beak, thick at base, and very sharp at the point; small round nostrils, pierced on the sides; the commissure of the mandibles forms a broken line, or is angular like that of the Starlings. They are American birds, whose manners are similar to those of the last mentioned ones, living like them in flocks, frequently constructing their nests close together, and sometimes with much art. They feed on grain and Insects, and do great injury to cultivated grounds. We subdivide them as follows:

Cassicus,(2) properly so styled.

The base of the beak mounts on the forehead, encroaching on the plumage, and forming a semicircular notch in it. The largest species belong to this subgenus.(3)

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(1) *Col. capensis*, Enl. 282, 1; Vaill. 258, and the young, 256. This latter is the *C. striatus*, and the *C. panayensis;*—*Col. erythropus*, Gm.; *leuconotus*, Lath. Vaill. 257;—*Col. gularis*, Vaill. 259.

I place near the Colies the birds called *Meriou natté* (*Malurus textilis*, Less.) and *Merion leucoptére* (*M. leucopterus*, Id.), Voy. de Freycin. pl. 23.

(2) Vieill. has adopted this name and genus.

(3) *Cassicus bifasciatus*, Spix, LXI, a;—*Cassic. angustifrons*, Id. LXII;—*Cass. nigerrimus*, Id. LXIII, 1;—*Oriolus cristatus*, Enl. 344;—γ 328;—*hemorrhous*, 482;—*persicus*, 184. (N.B. That it is not from Persia, but from America, like the others.)—A black species, with metallic reflections, the plumes of whose neck are erectile, and form a kind of mantle. It is the *Grand troupiale* of Azz. Voy. III, p. 167.

ICTERUS.(1)

The beak arcuated throughout its length, and only forming a small notch in the feathers on the forehead.(2)

XANTHORNUS.(3)

Only differs from the preceding in the perfect straightness of the beak.(4)

We should distinguish among the number a species with a somewhat shorter beak, which therein approaches the Fringilla, Cuv.

Icterus pecoris, Tem.; *Emberiza pecoris*, Wils. II, xviii, 1, 2, and Enl. 606, 1. (The Cow Bunting.) A violet black; head and neck a brown grey. Lives in flocks among the cattle; but the most peculiar trait in its habits is that, like the Cuckoo, it lays its eggs in other birds' nests.(5)

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(1) Vieillot has changed the French term of the above subdivision, *Troupiale*, into *Carouge*, which I had adopted for the following subgenus. He translates *Carouge* by *Pendulinus*, Galer. pl. 186.

(2) *Oriolus varius*, Enl. 607, 1;—*Or. cayanus*, 535, 2;—*Or. capensis*, Enl. 607. (N.B. It is from Louisiana, and not from the Cape;)—*Or. chrysocephalus*, Merr. Beytr. I, pl. iii, Vieill. Gal. 86;—*Or. dominicensis*, Enl. 5, 1;—and a species of a changeable black, whose tail assumes all kinds of shapes, according to the direction of its lateral feathers, which are sometimes in the same plane with the rest, and at others turned up, &c. (*Quiscalus versicolor*) Vieill. Gal. 108; Wils. III, xvi, 3. It appears to be both the *Gracula quiscala*, L., Catesb. pl. xii, and the *Gracula barita*, Lath. I, pl. xviii, or the *Pie de la Jamaique:* it is found in all the Antilles, Carolina, &c. It has been confounded with the Rice Eater (*Ploceus niger*).

We should separate the *Icterus sulcirostris*, Spix, LXIV, the lower jaw of whose much larger beak is obliquely furrowed at base.

(3) M. Vieill. calls these birds, *Baltimore* and *Yphantes*, Galer. pl. lxxxvii. He separates some of them, which he names more particularly *Troupiales*, or AGELAIUS, pl. lxxxviii.

(4) *Oriolus icterus*, Enl. 532;—*Oriolus minor* and *Tanagra bonariensis*, Enl. 710; the same bird;—*Oriolus citrinus*, Spix, 76;—*Le Car. gasquet*, Quoy and Gaym. Voy. de Freycin. pl. xxiv;—*Oriolus phœniceus*, Enl. 402;—*Or. americanus*, 236, 2;—*Or. leucopterus*, Lath. Syn. I, frontisp.;—*Or. bonana*, Enl. 535, 1;—*Or. cayenensis*, Ib. 2;—*Or. icterocephalus*, 342;—*Or. xanthocephalus*, Ch. Bonap, I, IV, 1, 2;—*Or. mexicanus*, Enl. 533;—*Or. xanthornus*, 5, 1;—*Or. baltimore*, 506, 1; Vieill. Galer. 87, and Wils. I, 1, 3;—*Or. spurius*, Enl. 2, and Wils. I, iv, 1—4;—*Or. melancholicus*, Enl. 448, of which *Ov. guyanensis*, Enl. 536, Vieill. Galer. pl. 88, is the adult.

Add *Or. agripennis*, Bonap. (*Enlb. oryzivora*, of others) our common *Reed Bird. Am. Ed.*

(5) Gmel. cites fig. 606, 1, of the Pl. Enl., as *Oriolus minor;* it is a mistake.

Oxyrynchus, Tem.

The conical and pointed beak of Xanthornus, but it is shorter than the head.

The species known, *Oxyr. flammiceps*, T.; *O. cristatus*, Swains. Ill. III, 49; Col. 125, has a partly red tuft on the head, like several of the Tyrants. The

Dacnis, Cuv.—Pit-Pits, Buff.

Resemble Xanthorni in their conical and short beak. They connect that subgenus with Regulus. The species known, *Mot. cayana*, L.; Enl. 669; Vieill. Gal. 165, is a small blue and black bird. [*See App. XXII of Am. Ed.*]

Sturnus, Lin.

The Starlings only differ from the Xanthorni in having a beak that is depressed, especially near the point.

S. vulgaris, L.; Enl. 75; Naum. 62. (The Common Starling.) Black with violet and green reflections, every where spotted with white or fawn colour. The young male is of a brown grey. It is found in great numbers throughout the whole of the eastern continent, feeds on insects, and is of use to cattle by relieving them from their attacks. It flies in large and crowded flocks, is easily tamed, and may be taught to sing and even to speak. It leaves France in winter. Its flesh is disagreeable.(1)

We can find no sufficient character to enable us to distinguish

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(1) Add the *Sturnus unicolor* of the south of Europe, Tem. Col. 3; Vieill. Gal. pl. xci;—*St. capensis*, Enl. 280, from which the *St. contra*, Albin. III, 21, does not differ, but which is from the Indies, and not from the Cape;—*St. militaris*, Enl. 113;—*St. ludovicianus*, Enl. 256, the same as the *Alauda magna*, Gm. Catesb. 1, 33, or the *Stournelle à collier*, Vieill. Gal. pl. xc, and Wils. III, xix, 2;—the *Etourneau à camail rouge* (*Oriolus ruber*, Gm.) Sonner. Nouv. g. pl. lxviii, or *Amblyramphus tricolor*, Leach, Zool. Miscel. pl. xxxvi; a beautiful species from the steppes of Buenos Ayres, and not from India, as stated by Sonnerat.

N.B. The *St. cinclus* forms, as we have seen, a genus allied to the Thrushes; the *St. sericeus*, Brown, III, 21, is rather a Gracula, Cuv.; the *St. collaris* is the same as the Fauvette of the Alps (*accentor*). The *St. carunculatus* should, I think, go along with Philedon.

The species of Osbec, Hernandes, &c. are not well authenticated; as to those of Pallas, it is to be regretted that we have no figures of them. The Stournes of Daudin must be replaced with the Thrushes, or the Philedons, and his Quiscales, partly with the Graculæ, Cuv. and partly with Cassicus. Daudin, generally speaking, completed the confusion of this genus, sufficiently entangled by his predecessors.

from the Conirostres with certainty and precision, the different genera of the family of the Crows, all of which have a similar internal structure and external organs, only differing in a (generally) greater size, which sometimes enables them to hunt small birds: their strong beak is most commonly compressed on the sides.

These genera are three in number, the Crows, Birds of Paradise, and the Rollers.

Corvus, Lin.

The Crows have a strong beak, more or less laterally flattened, nostrils covered with stiff feathers, which incline forwards. They are very cunning, their sense of smell is extremely acute, and they have, generally, a habit of purloining articles totally useless to them, such as pieces of money, &c., and even of hiding them.

We more particularly call Crows or Ravens, the large species whose beaks are the strongest in proportion, and in which the ridge of the upper mandible is the most arcuated. Their tail is either round or square.

C. corax, L.; Naum. 53, 1; Vaill. Afr. pl. 51.(1) (The Raven.) Is the largest of the Passerinæ which inhabit Europe. Its size is equal to that of the Cock. Its plumage is entirely black, the tail is rounded, and the back of the upper mandible arcuated near the point. It is a more solitary bird than the other species, flies well and high, scents carrion at the distance of a league, aud feeds also on fruit and small animals. It sometimes carries off poultry, builds on the tops of high trees or rocky cliffs, is easily tamed, and may be taught to speak tolerably well. It appears to be found in every part of the globe. In the north its plumage is frequently varied by a mixture of white (Ascan. Ic. Nat. pl. viii); it is then the *Corvus leucophæus*, Temm., Vieill. Gal. 100.

C. corone, L.; *La Corneille;* Enl. 495; Naum. 53, 2.(2) (The Carrion Crow.) A fourth smaller than the Raven; the tail more square, and the beak less arcuated above.

C. frugilegus, L.; *Le Freux;* Enl. 484; Naum. 55. (The Rook.) Still smaller than the preceding, with a straighter and more pointed beak. The circumference of the base of the lat-

(1) N.B. Enl. 495 appears to be nothing more than a *C. corone*, and 483 a young Rook. M. Temminck thinks that the quoted fig. of Le Vaillant is a particular species peculiar to Africa, which he names *C. montanus*.

(2) M. Temminck thinks there is a difference between the Crow of Europe and that of the Cape (Vaill. 52,) which he calls *C. segetum*.

ter, except when very young, is divested of feathers, which is probably occasioned by its habit of thrusting it into the ground in search of food.

These two species live in large flocks, numbers of them building together. They feed as much on grain as on insects, and are found throughout all Europe; remaining in the winter, however, only in the warmer districts.

C. cornix, L.; *Corneille mantelée;* Enl. 76; Naum. 54. (The Royston Crow.) Cinereous; head, wings, and tail, black. It is less frugivorous, frequents the sea-shore, and feeds upon shell-fish, &c. Nauman assures us that it often couples with the Black Crow.

C. monedula, L.; *Le Choucas*, &c.; Enl. 525; Naum. 56, 1. (The Jackdaw.) A fourth smaller than the preceding ones; about the size of a Pigeon; of a less intense black, which around the neck and under the belly, even verges on cinereous; sometimes all black. It builds in steeples, old towers, &c., lives in flocks, feeds on the same substances as the Crows, and is frequently found with them. Birds of prey have no enemy more vigilant than the Jackdaw.(1)

Pica, Cuv.

The Pies are less than the Cornix; the upper mandible is also more arcuated than the other, and the tail long and cuneiform.

Corvus pica, L.; Enl. 488; Naum. 56, 2. (The Magpie of Europe.) A beautiful bird, of a silky black colour, with purple, blue, and gold reflections; the belly is white, and there is a large spot of the same colour on the wing. Its eternal chattering has rendered it notorious. It prefers living in inhabited places, where it feeds on all sorts of matters, sometimes attacking the smaller birds of the poultry-yards.(2)

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(1) The Jackdaw terminates the tribes of the true Crows, because its upper mandible is hardly more arcuated than the lower one. Add to this tribe the *Corvus jamaicensis*, or *Corneille à duvet blanc;*—Le *C. dauricus*, Enl. 327; the *C. scapulatus*, Daud. Vaill. 53, which M. Temm. thinks differs from the preceding; the *albicollis*, Lath. or *Corbivau*, which, from its high, compressed, trenchant-backed beak, might constitute a separate subgenus, Vaill. 50;—the *C. splendens* of India, Vieill. Col. 425, remarkable for the instinct which prompts it to search for lice among the feathers of the Vulture, (the *Chagoun*) who willingly permits it;—The *C. columbianus*, Wils. III, xx, fig. 2;—the *C. nasicus*, Tem. Col. 413;—the *C. ossifragus*, Wils. V, xxxviii, f. 2, if it really differ from the *cornix*.

(2) Add the *Corvus senegalensis*, Enl. 538;—*C. ventralis*, Sh.; Vaill. Afr. 58;—*C. erythrorhynchos*, Enl. 622, and better Vaill. Afr. 57;—*C. cayanus*, Enl. 378;—*C. peruvianus*, Enl. 625;—*C. cyaneus*, Pall. Vaill. Afr. 58, 2;—*C. rufus*, Vaill. Afr. 59;—the *Acahe*, Azz. (*Corvus pileatus*, Illig.) Col. 58, or *Pica chrysops*, Vieill. Gal. 101;—the *G. gubernatrix*, Tem. Col 436;—the *Corv. azureus*, T. Col. 168;—the *Pie geng*. (*C. cyanopogon*, P. Max.) Col. 169.

Garrulus, Cuv.

The two mandibles of the Jays are but little elongated, terminating in a sudden, and nearly equal curve; when the tail is cuneiform, it is not very long, and the loose and slender feathers of the forehead stand more or less erect when the bird is angry.

Corvus glandarius, L.; Enl. 481; Naum. 58, 1. (The Jay of Europe.) Is a fine bird of a vinous grey, with mustachios, and the quills of the tail, black; particularly remarkable for a large spot of dazzling blue, striped with a deep shade of the same colour, which marks a part of the wing coverts. It feeds chiefly on the acorn, and of all birds shows the greatest penchant for imitating all kinds of sounds. It builds in the woods of Europe, and lives in pairs or in small flocks.(1) *See App. XXIII of Am. Ed.*

Caryocatactes, Cuv.(2)

The Nutcrackers have the two mandibles straight, equally pointed, and without any curve. There is only one species known.

Corvus caryocatactes, L.; Enl. 50; Naum. 58, 2; Vieill. Gal. 105. (The Common Nutcracker.) Brown; the whole body spotted with white. It builds in the hollows of trees, in dense mountain forests, climbs trees and perforates their bark like the Woodpeckers, feeds on all kinds of fruit, insects, and small birds. Flocks of them sometimes descend into the plains, but at very irregular intervals. It is celebrated for its confidence.(3)

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(1) Add *Corvus cristatus*, Enl. 529, Vieill. Gal. 102;—*Corv. Stelleri*, Vaill. Ois. de Par. &c. I, 44;—*Corv. sibiricus*, Enl. 608;—*C. canadensis*, Enl. 530, and a variety, Vieill. 48;—*C. cristatellus*, or *C. cyanoleucos*, P. Max.; Col. 193;—*C. ultramarinus*, T. Col. 439;—*C. torquatus*, T. Col. 44;—*C. floridanus*, Ch. Bonap. I, xiii, 1.

(2) Vieill. has changed this name into *Nucifraga*.

(3) N.B. The *Corvus hottentottus*, 226, appears to us to be allied to the Tyrants;—*C. balicassius*, 603, is a Drongo;—*C. calvus*, Enl. 521, a *Gymnoccphalus;*—*C. Novæ Guineæ*, Enl. 629 and *C. papuensis*, Enl. 630 belong to Graucalus, Cuv.;—*C. speciosus* of Sh. is the *Rollier de la Chine*, Enl. 620, and belongs to the *Dentirostres*. Temm. makes a Pyroll of it, Col. Enl. 401;—*C. flaviventris*, Enl. 249, is a Tyrant;—*C. mexicanus* is probably a Cassicus or a Weaver, and *C. argirophtalmus*, Brown, Ill., 10, is certainly one;—*C. rufipennis*, Enl. 199, is a Thrush, the same as *Turdus morio;*—*C. cyanurus*, Enl. 355, *C. brachyurus*, Enl. 257 and 258, and *C. grallarius*, of Shaw, Enl. 702 are Ant-catchers;—*C. carunculatus*, Daud., a Philedon.

We have approximated *C. pyrrhocorax*, Enl. 531, to the Thrushes and *C. graculus*, Enl. 255 to Upupa. We are of opinion that *C. eremita* does not exist. The *C. caribœus*, Aldrov. 788, is a Bee-eater, the account of which has been stolen by Dutertre to describe an object of which he had no recollection: finally, *C. gymnocephalus*, Tem. Col. 327, appears to us to belong to the family of the Dentirostres.

Temia, Vaill.(1)

The tail and carriage of the Pies, with an elevated beak, whose upper mandible is arched, the base furnished with velvet feathers almost like the Birds of Paradise.

The most anciently known, *Corvus varians*, Lath.; Vaill. Afr. 56; Vieill. Gal. 106, is of a bronze green. It is found in Africa and in India.(2)

Glaucopis, Forster.(3)

The same beak and carriage, but there are two fleshy caruncles under the base of the former.

The species known, *Glaucopis cinerea*, Lath. Syn. I, pl. xiv, is from New Holland, and is the size of a Pie; blackish, with a cuneiform tail. It feeds on insects and berries, and perches but seldom. Its flesh is highly esteemed.

Coracias, Lin.(4)

The rollers have a strong beak, compressed near the point, which is a little hooked. The nostrils are oblong, placed at the edge of the feathers, but without being covered by them; the feet short and stout. They belong to the eastern continent, and are like the Jays in their habits and in the loose feathers on the forehead. Their colours are vivid, but rarely harmonious. Some peculiarities of their anatomy approximate them to the Kingfishers and Pies, such as two emarginations in their sternum, a single pair of muscles to their inferior larynx, and a membranous stomach.(5)

The Rollers, *properly so called,*

Have a straight beak, every where higher than wide. There is one in Europe.

Coracias garrula, L.; Enl. 486. (The Common Roller.) Sea-green; back and scapulars fawn-coloured; pure blue on the tip of the wing; about the size of the Jay. It is a very wild bird, although sociable enough with its fellows, noisy, nestles in the

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(1) Vieillot has changed this name into Crypsirina, Gal. 106; Horsfield into that of Phrenotrix. Temminck unites Temia with Glaucopis.

(2) Add. *Glaucopis leucoptera*, Tem. Col. 285;—*Gl. temnura*, Id. Col. 337.

(3) Bechstein substitutes the term *Callæas* for that of *Glaucopis*.

(4) This name, consecrated by Linnæus, has been changed by Vieillot into that of Galgalus, which, among the ancient Latins, belonged to the Oriole.

(5) Nitsch, ap. Nauman, II, p. 156.

hollows of trees, and migrates in winter. It feeds on worms, insects and small frogs.

There are some Rollers foreign to Europe, which have a square tail(1); the external quills in that of the European species, however, are somewhat elongated in the male, the first indication of their great length in several others.(2)

Colaris, Cuv.(3)

Differs from Coracias in a shorter and more arcuated beak, and particularly in the enlargement of its base, which is more broad than high.(4)

Paradisæa, Lin.

The Birds of Paradise, like the Crows, have a strong, straight, compressed beak, without any emarginations, and with covered nostrils; but the influence of the climate they inhabit, an influence extended to birds of several other genera, gives a velvet tissue to the feathers which cover these nostrils, and frequently a metallic lustre, at the same time that it singularly developes those which cover several parts of the body. They are natives of New Guinea and of the adjoining islands; and as it is difficult to obtain them except from the savage inhabitants of those countries, who prepare them by cutting off the wings and feet, it was thought for some time that the first species was really destitute of those members, and lived constantly in air, supporting itself there by its long feathers. Travellers, however, having succeeded in obtaining perfect individuals of certain species, it is now known that their feet and wings indicate their claim to the place we have assigned to them. They are said to live on fruits, and to be particularly fond of aromatics.

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(1) *Coracias bengalensis*, Enl. 285, is evidently the same as the *indica*, Edw. 326 and as the fig. of Albin. I, 17, quoted under *caudata;—Coracias viridis*, Nob.; Vaill. 1, 31; Vieill. Gal. 110;—*C. Teminckii*, Vaill., pl. G.

(2) *Coracias abyssinica*, Enl. 626, and its variety *C. senegala*, Enl. 326, Edw. 327. *C. caudata* is merely an individual of the same species, disfigured by the addition of the head of a *bengalensis* (Vaill. loc. cit., p. 105).—*Cor. cyanogaster*, Nob., Vaill., loc. cit. pl. xxvi.

N.B. *Cor. caffra*, where Shaw quotes Edw. 320, can only be a Thrush (*Turdus nitens*);—*C. sinensis*, Enl. 620, by its emarginated beak also approaches either the Thrushes or the Shrikes. M. Shaw thinks that *C. viridis*, Lath. is an *Alcedo*.—*C. strepera* and *C. varia*, Lath. are Cassicans; *C. militaris* and *C. scutata*, Shaw, Piauhaus;—*C. mexicana*, Seb. 1, pl. lxiv, f. 5, is the Jay of Canada;—*C. cayana*, Enl. 616, a Tanager.

(3) *Colaris* is the Greek name of an unknown bird.—Vieillot has changed it into that of Eurystomus.

(4) *Coracias orientalis*, Enl. 619;—*Cor. madaguscariensis*, Enl. 501;—*Cor. afra*, Lath. Vaill. loc. cit., pl. xxxv.

The feathers on the flanks of some of them are silky, and singularly extended into bunches longer than the body, which give such a hold to the wind that they are very often swept away by it. There are also two bearded filaments adhering to the rump, which are as long, and even longer than the feathers on the flanks.(1)

P. apoda, L.; Enl. 254; Vaill. Ois. de Par. pl. 1; Vieill. Ois. de Par. pl. 1. Size of a thrush; maronne; top of the head and neck yellow; circumference of the beak and throat of an emerald green. It is the male of this species which is ornamented with those long bundles of yellowish feathers, employed by the ladies as plumes. There is a somewhat smaller race.

P. rubra, Vaill. pl. 6; Vieill. pl. 3. The fascicles of flank feathers of a beautiful red, and the filaments broader and concave on one side.

In others we still find the filaments, but the feathers on the flanks, although somewh at elongated, do not extend beyond the tail.

P. regia, Enl. 496; Vaill. 7; Vieill. 5, and Galer. 96. Size of a finch; a fine purple maronne; white belly; a band across the breast, the tips of the flank-feathers, and the barbs which widen the extremities of the two long filaments, emerald-green.(2)

P. magnifica; Sonnerat, 98; Enl. 631; Vaill. 9; Vieill. 4. Maronne above; green beneath and on the flanks; quills of the wings yellow; a fascicle of straw-coloured feathers on each side of the neck, another of a deeper yellow opposite to the fold of the wing.

Some have the slender feathers on the flanks, but they are short, and the filaments on the rump are wanting.

P. aurea, Gm.; *P. sexsetacea*, Shaw; Sonnerat, pl. 97; Enl. 635; Vaill. 12; Vieill. 6, and Galer. 97. Size of a Thrush; black; a golden-green spot on the throat; three feathers from each ear extended into long filaments, terminated by a small disk of barbs of the same colour as the spot on the throat.(3)

Others again have no filaments, nor are the feathers of the flanks elongated. In

P. superba, Sonnerat, 96; Enl. 632; Vaill. 14; Vieill. 7; Galer. 98(4), the feathers of the scapulars are prolonged, however, into a kind of mantlet which can be laid so as to cover the wings, and those of the breast into a sort of pendent and forked coat-of-arms. With the exception of this latter, which is of a

(1) M. Vieillot has made a genus of my first division, which he calls Samalia.

(2) Vieillot makes his genus Cincinnurus of this species.

(3) This species constitutes the genus Parotia, Vieill. Gal. 97.

(4) This species forms the genus Lophorina, Gal. 98.

brilliant burnished steel-green, the whole of the plumage is black.

P. aurea, Sh.; *Oriolus aureus*, Gm.; Edw., 112; Vaill. 18; Vieill. 11, has none of the preceding extraordinary developments of plumage, and is only distinguishable by the velvet feathers which cover its nostrils. The male is of the brightest orange; the throat, and primary quills of the wings, black; in the female, a brown takes the place of the orange.(1)

FAMILY IV.

TENUIROSTRES.

This family comprehends the remaining birds of the first division; those in which the beak is slender, elongated, sometimes straight, and sometimes more or less arcuated, and without any emargination. They are to the Conirostres what the Motacillæ are to the other Dentirostres.

Sitta, Lin.

The Nuthatches have a straight, prismatic, pointed beak, compressed near the point, which they employ like the Woodpeckers to perforate the bark of trees, and in withdrawing the larvæ contained in it; but their tongue is not extensible, and although they climb in every direction, they have but one toe behind, which, it is true, is a strong one. The tail is of no use in supporting them, as is the case with the Woodpeckers and True Creepers. There is but one in France.

S. europæa, L.; Enl. 623, 1; Naum. 139. (The European Nuthatch.) Bluish ash colour above; reddish beneath; a blackish band descending behind the eye; size of a Rouge-gorge.(2)

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(1) I refer the *Parad. gularis*, Lath., or *nigra*, Gm.; Vaill. 20 and 21; Vieill. 8, 9, and the *leucoptera*, Lath. to the Thrushes;—the *Par. Chalybæa*, Enl. 633, Sonn. 97; Vaill., 23; Vieill., 10, to the Cassicans;—the *cirrhata*, Aldrov. 814, is too much mutilated to be characterized, and the *furcata*, Lath. appears to be an imperfect specimen of the *superba*.

(2) Add the *S. à sourcil blanc* (*S. canadensis*, Briss.) Enl. 623, 2;—the *Black-headed N.* (*S. canadensis*, L.), Catesb., I, xxii; Vieill. Gal. 171;—*S. frontalis*, Swains. Zool. Ill. 2, or *S. velata*, Tem., Col. 72, 3, or *Orthorynchus frontalis*, Horsf. Jav.;—*S. chrysoptera*, Lath., 3d Supp. 327;—*S. pusilla*, Id.

It has been thought necessary to separate from the Sittæ, the

XENOPS, Illig.(1)

Which only differs in the beak being rather more compressed, and the inferior ridge more convex.(2)

ANABATES, Temm.

In which, on the contrary, the superior ridge of the beak is somewhat convex, almost like the beak of a Thrush which has no emargination. The tail, in some, is long and cuneiform, and occasionally worn, a proof that it supports them in climbing.(3)

SYNALLAXIS, Vieill.

A straight beak, but little elongated; very much compressed, slender, and pointed; the tail generally long and pointed.(4)

There are even some of them in which the stems of the tail-quills are very stout, and project beyond the barbs.(5)

Those birds which have received the name of

CERTHIA, Lin.

Or the Creepers, have an arcuated beak, but that is the only common character they possess.

We separate from them in the first place,

CERTHIA, Cuv.

The True Creepers, so called from their habit of climbing trees, like Woodpeckers, in doing which they make use of their tail as a prop or supporter; they are known by the quills of the tail, which are worn, and terminate in a stiff point, like those of the same birds.

There is one found in Europe,

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(1) Vieillot has changed this name into *Neops*.

(2) *Xenops rutilus*, Licht., Col. 72, 2, or *Neops ruficauda*, Vieill. Gal. 170;—*Xenops Hofmanseggii*, Col. 150, 1, Vaill. Prom. 31, 2;—*Xenops anabatoïdes*, Col. 150, 2.

(3) *Anabates cristatus*, Spix, 84;—*An. rufifrons*, Id. 85, 1;—*Philydor ruficollis*, Id. 75;—*Phil. albogularis*, Id., 74;—*Phil. superciliaris*, Id. 73; perhaps the same as the *Anabates amaurotis*, Tem. Col. 238, 2;—*Sphenura striolata*, Spix, 83, 2, or *Anabates striolatus*, Tem. Col. 23, 1.

(4) *Synallaxis ruficapilla*, Vieill. Gal. 174, or *Parulus ruficeps*, Spix, 86, from which the *Syn. albescens*, Tem. Col. 227, 2, and the *cinerascens*, Ib., 3, do not appear to me to differ specifically;—*Syn. rutilans*, Col. 227, 1;—*Syn. tessellata*, Col. 311, 1;—*Syn. setaria*, Ib. 2;—*Prinia familiaris*, Horsf. Jav.?—The *Flutcur*, Vaill. Afr. 112, or *Malurus africanus*, Swains. Ill. 170, merely has a somewhat higher beak.

(5) *Dendrocolaptes sylviellus*, Temm. Col. 72, 1. Vaill. prom. 31, 2.

C. familiaris, L.; Enl. 681, 1; Naum. 140. (The European Creeper.) A small bird with whitish plumage, spotted with brown above; rump and tail tinged with red. It builds in the hollows of trees, and climbs with great rapidity, searching for insects and larvæ in the cracks of the bark, under mosses, &c.(1)

America produces several True Creepers of a large size, called,

DENDROCOLAPTES, Herm.(2)—*Grimpars*, Vaill.

Whose tail is the same, but their beak is much stronger and wider.(3)

There is even one of them which approaches the Nuthatches in its straight and compressed beak; it might be taken for a Sitta with a worn tail.(4)

The beak of another, twice as long as the head, is only arcuated at the end.(5)

That of a third is long, slender and as much arcuated as in Melithreptus.(6)

TICHODROMA, Illig.(7)

The tail not worn, although they climb along walls and rocks just as the common Creepers do upon trees, but they cling to them

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(1) Add, *C. cinnamomea*, Vieill. Ois. Dor. 62, and Galer. 173;—*Motacilla spinicauda*, Lath. Syn. II, pl. 52?

(2) *Dendrocolaptes*, the Greek name of the Woodpecker. Vieillot has changed it into DENDROCOPUS, Gal. 175, and applied it to another division.

(3) The *Picucule*, Buff. (*Gracula cayennensis*, Gm ; *Grac. scandens*, Lath. & Sh.). Enl. 621 and Vieill. Ois. Dor. 76, to which the *Dendroc. decumanus*, Spix, 87, and *falcirostris*, 88, are at least closely allied. Add, the *Grand Grimpart*, Vaill. 42;—*Dendrec. tenuirostris*, Spix, 91, 2;—*D. bivittatus*, 90, 1;—*D. Wagleri*, 90, 2;—the *Gr. maillé*, Vaill. 29, 2;—the *Grimpart flambé*, Vaill. Prom. 30, or *Dend. platyrostris*, Spix, 89?—the *Gr. enfumé*, Vaill. 28.

N.B. The *Fluteur* of Vaill., Afr. 112, is the genus DASYORNIS of Swainson. The *Dendrocolaptes Sylviellus*, Tem. is his genus SITTASOMUS and the *Certhia maculata* of Wils. III, xix, 3, his genus OXYGLOSSUS.

The *Dendroprocurvus*, Tem. is the genus XIPHORHYNCHUS, Swains. and the *Tulapiot*, his genus DENDROPLEX.

(4) The *Tulapiot*, Buff.; *Oriolus picus*, Gm. and Lath.; *Gracula picoides*, Sh., Enl. 605, or *Dendrocolaptes guttatus*, Spix, 91, 1.

(5) The *Nasican*, Vaill., Prom., etc., 24.

(6) The *Grimpart promerops* (*Dendrocolaptes procurvus*,) Tem. Col. 28 or *Dendrocopus falcularius*, Vieill. Gal. 175.

(7) These birds are called *Echelettes* in some of the French provinces. Vieillot has changed this name into *Picchion*, and that of Illiger into PETRODROMA.

with their great claws. The beak is triangular and depressed at base, very long and very slender.

One species only is known, which inhabits the south of Europe, *Certhia muraria*, L.; Enl. 372; Naum. 141. It is a pretty bird of a light ash colour, the coverts and edges of a part of the wing-quills bright red. The throat of the male is black.(1)

Nectarinia, Illig.

Tail not worn, nor are these birds climbers, but their moderately long, arcuated, pointed and compressed beak resembles that of the Creepers. They are all foreign to Europe.

The name of Guitguits is more particularly applied to certain small species, the males of which are ornamented with lively colours. Their tongue is filamentous and bifid.(2)

We may separate from them the largest and least beautiful species, whose tongue is short and cartilaginous.

Merops rufus, Gm.; Enl. 739; *Figulus albogularis*, Spix, 78. A bird from South America, the size of a Kingfisher, reddish above, with a whitish throat, which constructs a nest upon shrubs, arched over like an oven.(3)

Dicæum, Cuv.(4)

The tail not worn, neither do they climb; their sharp pointed,

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(1) *Certh. fusca*, Lath. Vieill. 65, appears to me to belong to this subgenus.

(2) *Certh. cyanea*, Enl. 83, 2; Vieill., 41, 42, 43 and Gal. 176;—*cærulea*, Edw. 21, Vieill., 44, 45, 46, two American species, to which we must probably add some from the East, most of which are red, as *C. sanguinea*, Vieill. 66;—*C. cardinalis*, Id., 54, 58;—*C. borbonica*, Enl. 681, 2;—Vieill. Gal. 167, has given to these birds the name of Coereba.

N.B. *C. armillata*, Sparm. 36;—*C. cayana*, 682, 2, &c. are mere varieties of the *cyanea* or of the *cærulea*.

(3) This bird is the type of the genus Ophie or Opetiorhynchos of Tem.; Furnarius, Vieill. Gal. 182. The genus Figulus, Spix, does not differ from it. Add the *Picchion-baillon*, Viell, Gal. 172;—*Pomatorhinos montanus*, Horsf. Jav.;—*Pomat. turdinus*, T. Col. 441;—*Pom. trivirgatus*, T. Col. 443;—*Climacteris picumnus*, Tem. Col. 281, 1;—*Clim. scandens*, Ib. 2;—*Certhia flaveola*, Edw. 122, 362, Vieill. 51;—*C. varia* (*Mot. varia*, L.), Edw. 30, 2; Vieill. 74, which is the *Miniotille varié*, Id. Gal. 169;—*C. semitorquata*, Vieill. 56;—the *Promerops olivâtre*, Vaill. Huppes et Prom. pl. v (*Mer. olivaceus*, Sh.).—Here, also, is the place, I suspect, for the *C. virens*, Vieill. 57 and 58, and *sannio*, Id. 64, which I have not seen, but which are distinguished by their slightly forked tails.

(4) The name of a very small bird in the Indies, according to Ælian. To this subgenus belong, *Certh. erythronotos*, Viell. II, 35. The *C. cruentata*, Edw. 81, is probably a different age of the same;—*C. rubra*, Vieill. pl. liv, of which the *C.*

arcuated beak, which is not longer than the head, is depressed and widened at base. They inhabit the East Indies, are very small, and generally have some scarlet in their plumage.

Melithreptus, Vieill.

The tail not worn; beak extremely long, and curved almost into a semicircle. From the South Sea Islands. One of them,

Certhia vestiaria, Sh.; Vieill. Ois. Dor. II, pl. 52, and Gal. 181, is covered with scarlet feathers used by the Sandwich islanders in the manufacture of the beautiful mantles of that colour, which they so highly prize.(1)

Cinnyris, Cuv.(2)

Tail not worn; edges of the two mandibles of the long and very slender beak, finely serrate; the tongue, which is susceptible of protrusion, terminates in a little fork. They are small birds, the males of which, during the nuptial season, are ornamented with metallic colours, approaching in lustre to those of the Humming-bird, of which, in this respect, they are the representatives in the eastern continent, they being principally found in Africa and the archipelago of India. They live on the nectar of flowers, which they suck up with their bills; their disposition is lively, and their notes very agreeable. The beauty of their plumage has made them a common ornament of our cabinets, but as it is very different in both sexes during the winter, &c. it becomes an extremely difficult matter to characterize the species.

The tail, in most of them, is equal.(3)

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erythropygia, Lath. 2d supp., is probably the female;—the *Nectarinia rubicosa*, Tem. Col. f. 2 and 3, does not appear to differ from it.—*C. tæniata*, Sonner. II, Voy. pl. cvii, fig. 3;—*C. cantillans*, Ib. Id. 2;—*Motacilla hirundinacea*, Sh. Nat. Misc. No. 114.

(1) Add *Certh. obscura*, Vieill. Ois. Dor. II, pl. liii;—*C. pacifica*, Id. pl. lxiii; the other species of this naturalist belong to very different genera, chiefly to the Philedons, &c.

(2) The Greek name of some very small unknown bird. The natives of Madagascar call them *Souï-mangat*, i. e. eat-sugar. Vieillot has adopted the above name and genus, Gal. 177.

(3) *Certh. splendida*, Sh. Vieill. 82;—*C. caffia*, Edw. 347;—*C. superba*, Vieill. 22;—*C. lotenia*, Enl. 575, 2, 3, Vieill. 34;—*amethystina*, Vieill. 5 and 6;—*chalybæa*, Enl. 246, 3, Vieill. 10, 13, 18, 24, 34, 80;—*omnicolor*, Seb. I, 69, 5;—*cuprea*, Vieill. 23;—*purpurata*, Edw. 265, Vieill. 11;—*cyanocephala*, Vieill. 7;—*Z. zeilonica*, Enl. 576, 4; Vieill. 29, 30;—*dubia*, Vieill. 81;—*senegalensis*, Vieill. 8;—*sperata*, Enl. 246, 1, 2; Vieill. 16, 32, of which the *lepida* of Sparm. 35, is the female;—*madagascariensis*, Vieill. 18;—*curruca ria*, Enl. 576, 3, Vieill. 31;—*rubro-fusca*, Vieill. 27;—*fuliginosa*, Vieill. 20;—*maculata*, Vieill. 21;—*venusta*, Vieill. 79;—

In some, the two middle feathers are the longest in the male.(1)

We may also distinguish those which have a straight beak, or one that is nearly so.(2)

Arachnothera, Temm.

The long and arcuated beak of the Cinnyris, but stronger, and without emargination; the tongue short and cartilaginous; they are only found in the Archipelago of India, and feed on Spiders.(3)

Trochilus, Lin.

The Hummingbirds, so celebrated for the metallic lustre of their plumage, and chiefly for those plates, brilliant as precious stones, which are formed by scaly feathers of a peculiar structure, on their throat or head, have a long slender beak, enclosing a tongue, which they can protrude at will, like that of the Woodpeckers, (and by the same mechanism,) which is split almost to its base, forming two filaments employed, as is asserted, in taking up the nectar from flowers. They also, however, feed on small insects, for we have found their stomach filled with them. Their very small feet, broad tail, excessively long and narrow wings, short humerus and large sternum, which is without emargination, all contribute to form a system adapted for great power of flight, similar to that of the Swallows. The narrowness of their wing is caused by the rapid abbreviation of its quills. By these means, they balance themselves

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gutturalis, 578, 9;—*Nectarinia solaris*, Tem. Col. 341, 3;—*eximia*, Tem. Col. 138, 1, 2;—*pectoralis*, Id. Col. 138, 3;—*lepida*, Lath., Col. 126, 1, and Vieill. Gal. 177, 2;—*Hasselti*, T. Col. 376, 3;—*coccinogaster*, Tem. Col. 388, 3;—*Cinn. eques*, Less. and Garn. Voy. de la Coq. pl. xxxi, f. 1;—*javanica*, Zool. Ill. 121; some of which birds are probably mere varieties of the others.

(1) *Certhia famosa*, L. Enl. 83, 1;—*C. pulchella*, Enl. 670, 1;—*C. violacea*, 670, 2;—the *Sucrier cardinal*, Vaill. Ap. 291;—the *Sucrier figuier*, Id. 293, f. 2;—*Nectarinia metallica*, Licht. Ruppel., pl. vii and Col. 347, 1;—*Nect. mystacalis*, T. Col. 126, 3;—*N. Kuhlii*, T. Col. 376, 1, 2.

(2) *Cinnyris elegans*, Vieill. Gal. 177, or *Certh. rectirostris*, Id. Ois. Dor. II, pl. lxxv.

(3) *Arachnothera longirostra*, Tem. Col. 84, 1;—*A. inornata*, Id. Ib. 2.

N.B. After all these distinctions, we have still to remove from the great genus Certhia, the *C. lunata*, Vieill. 61;—*C. Novæ-Hollandiæ*, J. White, New S. W. pl. xvi and lxv; Vieill., 57, and 71;—*C. australasiana*, Vieill. 55;—*C. carunculata*, Vieill. 69, 70;—*C. auriculata*, Vieill. 85;—*C. cocincinica*, Enl. 643, Vieill. 77, 78; *C. spiza*, Enl. 578, 2, Edw. 25;—*C. seniculus*, Vieill. 50;—*C. graculina*, Vieill. 87;—*C. goruck*, Vieill. 88;—*C. cærulea*, Vieill. 83;—*C. xanthotis*, Vieill. 84;—*C. mellivora*, Vieill. 86; which, by their emarginated beak and pencil-like tongue, are all *Philedons*.

in air with nearly as much facility as certain Flies, and it is thus that they hum about flowers and fly with more proportionate rapidity than any other bird. Their gizzard is very small, and they have no cæcum, an additional mark of their affinity with the Woodpeckers. They live singly, defend their nests with courage, and fight desperately with each other.

The name of Trochilus, Lac., is especially reserved for such as have the beak arcuated; some of them are distinguished by the prolongation of the intermediate quills of their tail. We will mention but one of the largest and most beautiful.

Troch. pella; Colibri Topaze, Enl. 596. Purple-maronne; head, black; throat of the most brilliant topaz-yellow, changing into green, surrounded by black.(1)

The lateral quills of the tail are very long in others;(2) several have tails moderately forked;(3) in the greater number it is round or square.(4) We call,

Orthorhynchus, Lacep.

Such as have a straight beak; some of them have tufted heads.(5) Others have tufts or elongated feathers on the sides of the head,(6) and among them are found some with a pointed and very long tail.(7)

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(1) Add *Tr. superciliosus*, Enl. 600, 3; Vieill. 17, 18, 19;—*Tr. leucurus*, Enl. 600, 3;—*Tr. squalidus*, Natterer, Col. 120, f. 1;—*Tr. brasiliensis*, Lath. Col. 120, f. 2.

(2) *Tr. forficatus*, Edw. 33, Vieill. 30;—*polithmus*, Edw. 34, Vieill. 67, and particularly the magnificent Peruvian species, with the refulgent gold tail, *Tr. chrysurus*, Cuv.

(3) *Tr. elegans*, Vieill. 14.

(4) *Tr. mango*, L.; Enl. I, 680, 2 and 3, Vieill. 7;—*Tr. nævius*, Dumont, Col. 120, f. 3; *Tr. gutturalis*, Enl. 671;—*Tr. taumantias*, Enl. 600, 1;—*Tr. violaceus*, Enl. 600, 2;—*Tr. cinereus*, Vieill. 5;—*Tr. melanogaster*, Vieill. 75;—*Tr. jugularis*, Sh. Edw. 266, 1; Vieill. 4;—*Tr. holosericeus*, Sh., Vieill. 6 and 65;—*Tr. punctatus*, Sh., Vieill. 8;—*Tr. pectoralis*, Sh. 9 and 70;—*Tr. aurulentus*, Sh. Vieill. 12;—*Tr. aurcoviridis*, Sh., Vieill. 15;—*Tr. hirsutus*, Gm. or *brasiliensis*, Sh. Vieill. 20;—*Tr. albus*, Vieill. II;—*Tr. viridis*, Vieill. 15;—*Tr. margaritaccus*, Enl. 680, 1, Vieill. 16;—*Tr. multicolor*, Gm. or *Harlequin Hummingbird*, Lath. Supp. pl. cxi, Vieill. 79;—*Tr. lazulus*, Vieill. Gal. 179.

(5) *Tr. cristatus*, Edw. 87; Enl. 227, 1; Vieill. 47, 48;—*Tr. pilcatus (puniceus*, Gm.) Vieill. 63;—*Tr. Lalandii*, Vieill. 18, f. 1 and 2;—*Orthor. stephanioides*, Less. and Garn. Voy. de la Coquille, pl. xxxi, No. 2.

(6) *Tr. ornatus*, Enl. 640, 3, Vieill. 49, 50;—*Tr. chalybeus*, Vieill. 66, f. 2;—*Tr. pctasophorus*, P. Max. Col. 203, 3;—*Tr. scutatus*, Natter., Col. 299, 3;—*Tr. magnificus*, Illig. Col. 299, 2;—*Tr. mesoleucos*, Temm. Col. 317.

(7) *Tr. bilophus*, Temm.

N.B. M. Swainson has named those of our Hummingbirds, the middle quills of whose tail are elongated, Phætornis; those with a round or square tail, Lampor-

The stems of the primary wing-quills are singularly widened in some of them,(1) and among those which have none of these ornaments, we may still distinguish the fork-tailed species,(2) some of which have their very long lateral quills widened at the end.(3)

Among those which have a square or slightly emarginated tail, there is one worthy of notice from its extreme smallness, the

Troch. minimus, Enl. 276, 1; Edw. 105; Vieill. 64. It is of a violet-grey colour, and about the size of a Bee.

Another, on the contrary, because it is the largest of the whole genus, the

Troch. gigas, Vieill., Gal. 180, which is almost equal in size to the *Hirundo apus*.(4)

Upupa, Lin.

In this genus we will first place,

Fregilus, Cuv.(5)

Where the nostrils are covered with feathers directed forwards, from which circumstance several authors have placed these birds with the Crows, which they also somewhat resemble in their manners; their beak is a little longer than the head.

Corvus graculus, L.; *Le crave d'Europe*, Enl. 255; Naum. 57, 2; Vieill. Galer. 163. The size of a Crow; black; red feet and beak; wings reaching to the end of the tail or extending beyond

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nis; the straight beaked ones, in which the quills of the wings are inflated, Campylopterus; and those with a forked tail, Cynanthus.

(1) *Tr. latipennis*, Enl. 672, 2; Vieill. 21;—*Tr. cnsipennis*, Swains. Zool. Ill. 107;—*Tr. falcatus*, Ib. 82.

(2) *Tr. mellivorus*, Enl. 640; Edw. 35, Vieill. 23, 24;—*Tr. amethystinus*, Gm. Enl. 672, 1;—*Tr. furcatus*, Enl. 509, 2; Vieill. 34;—*Tr. forficatus*, Vieill. 60;—*Tr. smaragdo-saphirinus*, Vieill. 36, 40;—*Tr. colubris*, Edw. 38; Catesb. 65; Vieill. 31, 32, 33;—*Tr. Maugeanus*, Vieill. 37, 38;—*Tr. Langsdorifii*, Vieill. 66, 1;—*Tr. cnicurus*, Vieill. 66, 3;—*Tr. mediastinus*, Tem. Col. 317;—*Orthor. cora*, Less. and Garn. 34, 4.

(3) *Tr. platurus*, Vieill. 52.

(4) Other species with square, or but slightly emarginated tails: *Tr. mosquitus*, L., Enl. 227, 2;—*Tr. carbunculus*, Vieill. 54;—*Tr. ourissia*, Enl. 227, 3;—*Tr. mellisugus*, L. Enl. 640, 2;—*Tr. rubineus*, Gm. Enl. 276, 4, Vieill. 27;—*Tr. auritus*, Sh. Vieill. 25;—*Tr. collaris*, Vieill. 61, 62;—*Tr. superbus*, Sh.; *longirostris*, Vieill. 59, Col. 299, 1;—*Tr. mellivorus*, I, Enl. 640, 2;—*Tr. leucogaster*, Gm. Vieill. 43;—*Tr. imbricatus*, Gm. Vieill. 221;—*Tr. albirostris*, Vieill. 45;—*Tr. viridis*, Vieill. 41;—*Tr. maculatus*, Vieill. 44;—*Tr. saphyrinus*, Sh. Vieill. 35 and 57, 2;—*Tr. squamosus*, Tem. Col. 203, 1;—*Tr. albicollis*, I, Col. 203, 2;—*Orthor. Amasili*, Less. and Garn. Voy. de la Coq. 31, 3.

(5) Vieillot has changed this name for Coracias, which, according to Linnæus, is that of the Rollers.

it. It inhabits the highest ridges of the Alps and Pyrenees, nestling there among the cliffs or in the fissures of the rocks like the Chocard; it is less common, however, and does not so often unite in flocks. It feeds both on fruit and insects, and when it descends into the valleys, snow or bad weather may be expected.(1)

Upupa, *properly so styled.*

The Hoopoes have an ornament on the head formed of a double range of long feathers, which they can erect at will. There is one in Europe,

U. epops, L.; Enl. 52; Naum. 142. (The Hoopoe.) A vinous-red; wings and tail, black; two transverse, white bands on the coverts of the wings, and four on the quills. It seeks insects in humid earth, lays its eggs in holes of trees or of walls, and leaves France in winter.(2)

U. capensis; Enl. 697. (The Cape Hoopoe.) More particularly allied to Fregilus by the anterior, short, and immovable feathers of its tuft which incline forwards and cover the nostrils.

Promerops, Briss.

No crest on the head, and a very long tail; the tongue, extensible and forked, enables it, as is affirmed, to live on the nectar of flowers, like the Cinnyris and the Hummingbirds.(3)

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(1) It is impossible to say what combination of the history of this bird with imperfect figures, perhaps of some Curlew, gave birth to the ideal species of the *Cravé huppé* or *Sonneur* (*Corvus eremita*, L.), a pretended bird of Switzerland, which has never been seen by any one since Gesner. But the *Corv. affinis*, Lath. appears to be a true Fregilus, and we have a totally black species from New Holland.

(2) Add the African species, *Upupa minor*, Vieill. Prom. pl. ii, and Gal. pl. 184; Vaill. Prom. 23.

(3) Vieill. Galer. pl. clxxxv, has changed *Promerops* into *Falcinellus*. The only one well known is the *Upupa promerops* or *Merops caffer*, Enl. 637, which is the *Sucrier du protea*, Vaill. Afr. 139. M. Vaill. is of opinion that the *Up. fusca*, Gm., or *papuensis*, Lath. Enl. 638, is the female of the *Epimaque à parements frisés*, Enl. 639.—The *Up. paradisœa*, Seb. I, pl. xxx, 8, is the *Muscicapa paradisi*, with an ill drawn beak. The *Up. aurantia*, Seb. I, lxvi, 3, according to all appearance a Cassicus. The *mexicana*, Seb. I, xlv, 3, is not from Mexico as Seba makes it out, by applying to it a passage of Nieremberg, lib. x, c. 44, in which he merely speaks of a Duck. I am in doubt whether to place here the *Promerops cæruleus*, Shaw; *Prom. bleu*, Vieill.; *Upupa Indica*, Lath. or to approximate it to the *Up. erythrorhynchos*.

EPIMACHUS, CUV.(1)

The beak of the Upupa and Promerops along with scaly or velvet feathers which partially cover the nostrils, as in the Birds of Paradise; they are natives of the same countries, and their plumage equally brilliant. The flank-feathers of the male are also more or less elongated.

Upupa magna, Gm.; *U. superba*, Lath.; *l'epimaque à pare. frisés*, Enl. 639; Vaill. Prom. 13. Black; tail tapered, thrice the length of the body; the feathers on the flanks, elongated, turned up, frizzled, the edges of a burnished steel-blue, which also glistens on the head and belly.(2)

Naturalists have distinguished the square-tailed species, PTILORIS of Swainson, such as,

Ep. albus; Paradis. alba; Blumen. Abb. 96; Vaill. Ois. de Par. pl. 16 and 17, and better Promer. 17; Vieill. pl. 13, and better Gal. 185, which, for a long time, was placed among the Birds of Paradise, on account of the long bunches of white plumes, which decorate its flanks, the stems of these plumes being continued out, forming six filaments on each side. The body is usually of a violet black, and the feathers on the bottom of the breast have an edging or border of emerald green. It appears, however, that there are varieties with an entirely white body. The primaries of the wing are short, and much less numerous than in birds generally.

Epim. magnificus, Cuv.; *Epimaque proméfil*, Vaill., Prom. 16. Velvet-black; tail, slightly forked; head and breast of a most brilliant steel-blue; feathers on the flanks, long, fringed, and black.

Epim. regius, Less and Garn., Voy. de Duperr., pl. 28; *Ptiloris paradisæus*, Swains. A purple black; top of the head and upper part of the breast of a fine brilliant green; feathers on the flanks, rounded and edged with green.

The second and smallest division of the Passerinæ comprehends those in which the external toe, which is nearly as long

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(1) *Epimachus*, the Greek name of a beautiful undetermined East Indian bird.

(2) I hardly know whether I should place the *Promerar*, Vaill., 8 and 9;—the *Promerup*, Vaill., 11 and 12, and his *Promerops siffleur*, 10, here, or near the *Up. erythorhynchos*. These beautiful birds of New Guinea, which are very rare in our collections, are usually deprived of their feet, which renders it impossible to class them with certainty.

as the middle one, is united to it as far as the penultimate articulation. We make but a single group of them, the

SYNDACTYLÆ,

Which has long been divided into five genera.

Merops, Lin.

The Bee-eaters have an elongated beak, triangular at base, slightly arcuated and terminating in a sharp point. There is a double emargination on each side of the hind part of the sternum. Their long, pointed wings, and short feet render their flight similar to that of Swallows. They pursue insects in great flocks, especially bees, wasps, &c. and it is remarkable, they are never stung by them.

There is a species, common in the south of Europe, but rare towards the north, the *M. apiaster*, L.; *Guèpier commun*, Enl. 938; Naum. 143; Vaill., Guep., 1 and 2. (The Common Bee-eater.) A beautiful bird with a fawn coloured back; front and belly of a sea-green blue; throat yellow, surrounded with black. It builds in holes excavated by itself along the banks of streams, which are from four to five feet in depth. The young birds remain a long time in this retreat with their parents, which induced the ancients to believe that the former supported the latter when worn out with age.

The two middle quills of its tail are somewhat lengthened, the first indication of a much greater elongation in the greater part of the species foreign to Europe.(1)

The tail of several species, however, is nearly square(2) or slightly forked,(3) though this sometimes depends upon their condition when killed.

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(1) Such are: *Mer. viridis*, 740, Vaill. 4;—*ornatus*, Lath.;—*superbus*, Nat. Misc. 78;—*senegalensis*, Enl. 314, and *badius*, 252, Vaill. 12, 13;—*superciliosus*, 259, Vaill. 19.—*M. nubicus*, Vaill. 5, Enl. 649; this individual had been deprived of its long quills.—*M. Savignii*, Vaill. 6.—*M. Cuvieri*, Vaill. 9, and Swains. Ill. 76, under the name of *Savignii*.—*M. Lamark*, Vaill. 10.

(2) *Merops philippinus*, Enl. 57;—*M. cayennensis*, 454 (N.B. That it is not from Cayenne).—*M. nubicus*, 649;—*M. erytropterus*, 318;—*M. malimbicus*, Sh. or *bicolor*, Daud. Ann. du Mus. I, lxii, and Vaill. 5, Vieill. Gal. 186;—*M. gularis*, Nat. Misc. 387;—*M. amictus*, T. Col. 310;—*M. Daudin*, Vaill. 14.—*M. coromandus*, Lath. Sonnerat, Voy. 2, 105, or *G. cytrin*, Vaill. 11;—*M. quinticolor*, Vaill. 15;—*M. minulus*, Vaill. 17;—*M. Lechenaud*, Vaill. 18;—*M. Bullock*, Vaill. 20.

(3) *M. taiva*, Vaill. 8.—*M. urica*, Swains. Zool. Ill. 8. N.B. The *Merops congener*, Aldr. I, 876, is not very authentic;—the *cafer*, Gm. is the *Upupa promerops*;—the *brasiliensis*, Seb. I, lxvi, 1, is most probably an Icterus;—the *M. monachus, corniculatus, cyanops*, are Gymnops;—the *Mer. phrygius, cincinnatus, cucullatus, cyanops*,

We should approximate to the Bee-eaters certain long-tailed birds, with metallic-coloured plumage, hitherto classed with Promerops, but whose two external toes are almost as extensively united as those of the former.(1)

There appears to be none of this genus in America, where they are represented in some respects by the

Prionites, Illig.

The Motmots have their feet and carriage, but differ in the beak which is stronger, the edges of both mandibles being serrated, and in their tongue, which, like that of the Toucans, is barbed. They are beautiful birds, as large as the Magpie; the plumage on the head, loose as in the Jays, and a long cuneiform tail; the stems of the two middle quills being stripped of their barbs for a short distance near the extremities, gives to the whole a singular appearance. They fly badly, are solitary, build in holes, feed on insects, and even on small birds.(2)

Alcedo, Lin.

The Kingfishers have shorter feet than the Bee-eaters, and the beak much longer, which is straight, angular, and pointed; the tongue and tail are very short. There are two emarginations in their sternum, as in those of the Bee-eaters and the Rollers. They feed on small fish which they capture by precipitating themselves into the water from some branch where they have remained perched, watching for their prey. Their stomach is a membranous sac. They nestle like Bee-eaters in holes on the banks of streams, and are found in both continents. The European species,

A. ispida; Enl. 77; Naum. 144. The size of a Finch; greenish

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garrulus, fasciculatus, carunculatus, of Lath. appear to us to be Philedons; we have even ascertained this to be the fact with respect to most of them;—the *M. cinereus,* Seb. XXXI, 10, is a long tailed *Cinnyris* or *Soui-manga.*

(1) The *Promerops moqueur,* Vaill. Prom. 1, 2, and 4 (*Upupa erythrorhynchos,* Lath.). The young bird has a black beak.—The *Prom. namaquois,* Vaill. 5 and 6, or *Falcin. cyanomelas,* Vieill.

(2) The *Blue-headed Motmot,* or the Houtou of Guyana, *Guira, guaynumbi* of the Brazilians, according to Marcgrave (*Ramphastos momota,* Gm.); or *Pr. brasiliensis,* Illig. Enl. 370; Vaill. Ois. de Par. &c. I, pl. xxxvii and xxxviii;—the *Motmot à tete rousse* or of Peru; *Motmot dombey,* Vaill. loc. cit. pl. xxxix, and Vieill. Gal. pl. cxc;—*Pr. Marcii,* Spix, 9;—the *Tutre* of Paraguay, Azz. No. 52, are, to say the least, closely allied to it.

Motmot, according to Fernandez, is the Mexican name of the first. *Prionitis,* from πριων, saw, a name given by Illiger. M. Vieillot has changed it into Baryphonus.

waved with black above; underneath, and a band on each side of the neck, reddish; a wide band of the most beautiful aquamarina blue along the back.

The species foreign to Europe have also a smooth plumage variegated with different shades of blue and green.

They may be distinguished among themselves by the beak, which in some is simply straight and pointed as in the common species,(1) and in others, has an inflated lower mandible.(2)

Of those found in New Holland and its neighbouring countries, some have a mandible hooked at the point.(3) The greyish and dull plumage of several of the latter is an indication of their not visiting the water, and in fact they feed on insects.

Ceyx, Lacep.

Kingfishers with the usual beak, but in which the internal toe is deficient. Three species are found in India.(4)

Todus, Lin.

The Todies are small birds of America resembling the Kingfishers in their general form as well as in their feet and elongated beak, but the latter is horizontally flattened, and obtuse at the point.

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(1) *Alc.* (*afra*, Sh.) *maxima*, Enl. 679;—*alcyon*, 715 and 593, and Wils., Am. III, xxxiii, 1;—*torquata*, 284;—*rudis*, 62 and 716;—*bicolor*, 592;—*americana*, 591;—*bengalensis*, Edw., II;—*cærulco-cephala*, Enl. 356, 2;—*cristata*, 756, 1;—*madagascariensis*, 778, 1;—*purpurea*, 778, 2;—*superciliosa*, 756, 1 and 2;—*cinerifrons*, Vieill. Gal. 187;—*Biru*, Horsf. Jav., and T. Col. 289, 1;—*semi-torquata*, Swains. Ill. 154;—*asiatica*, Ib. 50.

(2) *Al. capensis*, 599;—*atricapilla*, 673;—*smirnensis*, 232 and 894, one of the two species distinguished by Aristotle;—*dea*, 116, of which Vigors makes his genus Tanysiptera;—*chlorocephala*, 783, 2;—*coromanda*, Somer. 218;—*leucocephala* (*javanica*, Sh.), 757;—*senegalensis*, 594 and 356;—*cancrophaga*, Sh. 334;—*melanorhyncha*, T. Col. 391;—*omnicolor*, T. Col., 135;—*diops*, Id. Col. 212;—*Dacelo concreta*, Id. Col. 346;—*Dacelo cinnamominus*, Swains. Ill., 67. It is from this division that M. Leach has made his genus Dacelo.

N.B. In several of the fig. Enl. the beaks are not sufficiently inflated.

(3) *Alcedo fusca* (*gigantea*, Sh.), Enl. 663; Vieill. Gal. 188;—*Dacelo pulchella*, Horsf. Jav. and T. Col. 262;—*Dac. Gaudichaud*, Quoy and Gaym. Voy. de Freycin. pl. xxv.

N.B. M. Lesson separates the species with denticulated beaks from the Kingfishers, by the name of Syma; and by that of Todiramphes, those whose beak is a little depressed and without a ridge, such as *Alcedo sacra*, Lath. See his Mém. among those of the Soc. d'Hist. Nat. tom. III, pl. xi and xii.

(4) *Alcedo trydactyla*, Pall. and Gm.; Pall., Spic., VI, pl. 11, f. 2; Sonner. pl. xxxii;—*Alc. tribrachys*, Sh. Nat. Misc. XVI, pl. 681;—*Alc. meninting*, Horsf., Col. 239, 2.

The tarsus also is higher, and the tail not so short. They feed on flies and build on the ground.(1)

We terminate the history of this order with the most singular of its genera, a genus which has not as much resemblance to the other Syndactylæ as they have to each other, and one which may very properly be made to form a particular family. It is the

Buceros, Lin.

The Hornbills are large birds of Africa and India, whose enormous dentated beak is studded with excrescences which sometimes equal in size the beak itself, and which are always of considerable extent above. This renders them very remarkable, and allies them to the Toucans, while, at the same time, their carriage and habits approximate them to the Crows, and their feet to the Bee-eaters and the Kingfishers. The shape of these excrescences on the beak varies with age, and in the very young bird they are not even visible; the interior is generally cellular. The sternum is slightly emarginated behind, on both sides. The tongue is small and placed at the bottom of the throat; they live on all sorts of food, eat soft fruits, hunt mice, small birds, reptiles, and do not even despise carrion.(2)

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(1) *Todus viridis*, Enl. 585, 1 and 2, and Vieill. Gal. 124;—*T. cæruleus*, Enl. 783, 1.

Authors have very improperly placed among the Todies, true Muscipetæ, with an emarginated beak and the external toe free, such as the *Todus regius*, Enl. 289;—*paradisæus*, Ib., 234;—*leucocephalus*, Pall. Spic., VI, iii, 2;—the two Platyrhinci of Desmarets, which are the *Tod. rostratus* and *nasutus* of Shaw, or *Tod. platyrhynchos* and *macrorhynchos*, Gm. Vieill., gives the first, Gal. 126.

(2) Hornbills with excrescences. *Buc. rhinoceros*, Enl. 934, Vaill. *Callaos*, 1 and 2; *B. africanus*, Vaill., pl. 17, f. 2, may be a mere variety from age; *niger*, Vaill., 13, according to Tem. is a badly preserved specimen of the same;—*monoceros*, Sh. Enl. 873; Vaill. 9, 10, 11, 12;—*cassidix*, Temm. Col. 210;—*malabaricus*, Lath. VI, ii, or *albirostris*, Sh.; Vaill. Col. 14;—*buccinator*, T. Col. 284;—*gingianus*, Sonn. Voy. II, pl. cxxi; Vaill., 15;—*bicornis*, Vaill. 7, the adult female; *cavatus*, Id. 4, is the male at a middle age. The pl. 3 and 5 are altered specimens of the same.—*B. hydrocorax*, Enl. 282, the young bird; Col. 283, the adult;—*violaceus*, Id. 19;—*abyssinicus*, Enl. 779, the middle age; Vaill. Afr. 230, 231, the adult; Vieill. Gal. 191;—*sulcatus*, T. Col. 69;—*panayensis*, Enl. 780, the female, and 781 the old male; Vaill. Col. 16, 17, 18; *manillensis*, Enl. 891, should be the young bird;—*fasciatus*, Vaill. Afr. 235;—*exaratus*, T. Col. 211.

Hornbills without excrescences. *B. javanicus*, Vaill. Cal. 22, the young male; Afr. 239, the old male, same as the *Cal. de Waidjiou*, Labill. Voy., *B. undulatus*, Vaill. Cal. 20 and 21, are females of the same; *B. erythrorhynchos*, Enl. 260; Vaill. Afr. 238, the young one;—*hastatus*, Cuv.! Enl. 890, Vaill. 236, 237;—*coronatus*, Vaill. Afr. 234, 235;—*bengalensis*, Cal. 23.

ORDER III.

SCANSORIÆ.

This order is composed of those birds whose external toe is directed backwards like the thumb, by which conformation they are the better enabled to support the weight of their bodies, and of which certain genera take advantage in clinging to and climbing upon trees. It is from this that they have received the common name of Climbers, which in strictness is not applicable to all of them, as there are many true Climbers which by the disposition of their toes cannot belong to this order, instances of which we have already seen in the Creeper and Nuthatch.

The Scansoriæ usually nestle in the hollows of old trees; their powers of flight are middling; their food, like that of the Passerinæ, consists of insects or fruit, in proportion as their beak is more or less stout; some of them, the Woodpeckers for instance, have peculiar means for obtaining it.

The hind part of the sternum, in most of the genera, has a double emargination; in the Parrots, there is merely a hole, and very often that is completely filled up.

Galbula, Briss.

The Jacamars are closely allied to the Kingfishers by their elongated sharp-pointed beak, the upper ridge of which is angular, and by their short feet, the anterior toes of which are almost wholly united; these toes, however, are not precisely the same as those of the Kingfishers; their plumage moreover is not so smooth, and

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N.B. The *B. galeatus*, of which we only have the head, Enl. 933, and which Vaillant erroneously considers as an aquatic bird, is a true Hornbill, but whose excrescence on the beak is invested with an excessively thick horn, the anterior portion of it particularly.

See the general article on the Hornbills, by Temminck, in the text of the *Planches Coloriées*. P.S. It is to General Hardwick that we are at length indebted for a knowledge of the *B. galeatus*, which proves to be, in fact, a true Hornbill, with a long cuneiform tail; black; white belly; the tail yellowish, with a black band near the end. Lin. Tr. XIV, pl. xxviii.

always has a metallic lustre. They are solitary birds, that live in wet forests, feed on insects, and build on low branches.

The American species have a longer and perfectly straight beak.(1)

There are some species in the Archipelago of India, whose shorter, stouter and slightly arcuated beak approximates them to the Bee-eaters. Their anterior toes are more separate. They constitute the JACAMEROPS of Vaillant,(2) who even gives a figure of one that has no ridge above.(3)

Finally, there are others—the *Jacamar-Alcyon*, which have only three toes. They inhabit Brazil.(4)

PICUS, Lin.(5)

The Woodpeckers are well characterized by their long, straight, angular beak, the end of which is compressed into a wedge, and fitted for splitting the bark of trees; by their slender tongue, armed near the tip with spines that curve backwards, which by the action of the elastic horns of the hyoid bone, can be thrust far out of the beak, and by their tail, composed of ten quills(6) with stiff and elastic stems, which acts as a prop in supporting them while they are climbing. They are Climbers par excellence: they wander over trees in every direction, striking the bark with their beaks, and insinuating their long tongue into its cracks and crevices to obtain the larvæ of insects, on which they feed. This tongue, besides its armour, is constantly covered with a viscid fluid, secreted by large salivary glands: it is drawn back into the beak by two muscles, which are wound round the trachea like ribands; in this state of retraction, the horns of the hyoid ascend under the skin and round the head, as far as the superior base of the beak, and the sheath of the tongue is doubled into folds in the bottom of the throat. Their

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(1) *Alcedo paradisæa* (*Galbula paradisæa*, Lath.), Enl. 271;—*Alcedo galbula*, L. (*Galb. viridis*, Lath.) Enl. 238;—*Galb. ruficauda*, Nob. Vaill. Ois. de Par. &c. II, pl. l; or *G. macroura*, Vieill. Gal. 29;—*Galb. albirostris*, Lath. Vaill. pl. li; Vieill. Ois. Dor. I, pl. iv;—*Galb. albiventris*, Vaill. xlvi.

(2) *Alcedo grandis*, Gm.; *Galbula grandis*, Lath. Vaill. pl. liv.

(3) The *Grand Jacamar*, Vaill. I, cit. pl. liii.

Jacamaciri is the Brazilian name of these birds, according to Marcgrave. *Galbula*, among the Latins, appears to have indicated the Oriole, it was Mœhring who transferred it to the Jacamars.

(4) Vaill. Jac. Sup. f. l, and Spix, 57, 2, by the name of *Alcyon tridactyla*.

(5) *Picus*, the Latin name for these birds, given to them, it is said, by a king of Latium.

(6) Strictly speaking, there are twelve; but the lateral ones, which are very small, are not counted.

stomach is nearly membranous, and they have no cæca, still they also eat fruit. Fearful and wary, they pass most of their time in a solitary manner, but during the nuptial season they may frequently be heard summoning their females by loud and rapid tapping on a dry branch. They build once a year in holes of trees, and each sex alternately broods upon the eggs until they are hatched. There are six or seven species in Europe.

P. martius, L.; *Grand Pic noir;* Enl. 596; Naum. 131. (The Great Black Woodpecker.) Almost as large as a Crow, and entirely black; a beautiful red forms a calotte in the male, but a mere spot on the occiput in the female. It prefers the pine forests of the North.

P. viridis; Pic vert; Enl. 371; Naum. 132. (The Green Woodpecker.) Size of a turtle-dove; green above; whitish beneath; the calotte red; rump, yellow; one of the most beautiful birds of Europe. The young are marked with black spots beneath, and with white ones on the mantle. It prefers inhabiting the woodland plains, and is partial to the beech and elm. It also seeks food on the ground.

P. canus, Gm.; Edw. 65; Naum. 133. A species closely allied to the preceding, but smaller, more of an ash colour, the beak more slender, and with a black moustache. The only red about the male is on the top of the head, and there is none on the female. It is not found far to the south, and is more rarely seen in France than the preceding, of whose habits it partakes. Its favourite food consists of ants.

P. major; L'Epeiche; Enl. 196, the male, 595, the female; Naum. 134. (The Great Spotted Woodpecker.) Size of a Thrush, varied with black and white above; black back and rump; white beneath; red about the vent; a spot of the same colour on the occiput of the male. The calotte of the young bird is almost wholly red; it prefers evergreen trees, frequently approaches our dwellings, but never lights on the ground.

P. medius; Moyen Epeiche; Enl. 611; Naum. 136, f. 1 and 2. Somewhat less; the whole calotte red in both sexes; rump, black; under part of the tail, reddish. Inhabits temperate and southern Europe.

P. minor; Petit Epeiche; Enl. 598; Naum. 136, f. 2 and 3. (The Little Spotted Woodpecker.) Size of a Finch; variegated with black and white above; greyish-white beneath; some red on the head of the male only. From the north and middle of Europe. It is asserted that it searches for ants on foot; but Naumann assures us that such is not the fact.

P. leuconotos, Bechst.; Naum. 135. A spotted Woodpecker

from the north-east of Europe, somewhat larger than the *major* and very similar to it; but the lower part of the back and rump are always white, and the calotte of the male red. It sometimes wanders as far as Germany.

The species foreign to Europe are very numerous, and have a great mutual resemblance, which even extends to certain distributions of colour; the red on the head for instance.(1)

There are certain species of Woodpeckers called by Lacépède PICOIDES, in which the external toe is wanting; having, consequently, but two before, and one behind; but, in all other respects, they are similar to the common ones. There is one of them in the north and east of Europe.

P. tridactylus; Edw. 114; Naum. 137. Intermediate, as to size,

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(1) Species analogous to the Black Woodpecker: *P. pileatus,* L. Enl. 718;—*P. lincatus,* L. Enl. 717;—*P. principalis,* L. Enl. 690;—*P. galeatus,* Natter. Col. 171, four closely allied species, to one of which probably belongs the *P. melanoleucos,* Gm.; Lath. Syn. I, 2, t. xxv;—*P. rubricollis,* Gm. Enl. 612;—*P. robustus,* Spix, 44;—*P. albirostris,* Id. 45;—*P. validus,* T. Col. 378, and the female, 402;—*P. erythrocephalus,* L. Enl. 117;—*P. pulverulentus,* T. Col. 389;—*P. concretus,* Reinw. Col. 90;—*P. chilensis,* Voy. de la Coq. 32;—*P. torquatus,* Wils. Am. III, xx, 3;—*P. dominicanus,* Spix, 50.

Species analogous to the Green Woodpecker: *P. percussus,* T. Col. 390 and 424, the female;—*P. bengalensis,* L. Enl. 695, of which *P. aurantius,* Gm. Briss. IV, pl. vi, f. 1, is probably a mere variety;—*P. goensis,* Gm. Enl. 696;—*P. aurulentus,* Illig. Col. 59, fig. 1, or *macroccphalus,* Spix, 53, 2;—*P. puniceus,* Horsf. Col. 423;—*P. mentalis,* Col. 384;—*P. ceylonus,* N. Nat. Forsch. 14, pl. 1;—*P. goertan,* Gm. Enl. 320;—*P. manillensis,* Gm.; Sonner. pl. xxxvi;—*P. senegalensis,* Gm. Enl. 345, f. 2;—*P. passerinus,* Gm.; Briss. IV, t. iv, f. 2;—*P. luzonicus,* Nob. Sonn. pl. xxxvii;—*P. miniatus,* Gm. Ind. Zool. t. VI;—*P. chlorocephalus,* Gm. Enl. 784;—*P. exalbidus,* Gm. Enl. 509;—*P. cinnamomeus,* Gm. Enl. 524;—*P. palalaca,* Nob. Enl. 691;—*P. jumana,* Spix, *pochraccus* and *flavicans,* Id. 51.

Species analogous to the Spotted Woodpeckers: *P. rubriventris,* Vieill. Gal. 27;—*P. hirundinaccus,* L. Enl. 694;—*P. varius,* Gm. Enl. 785;—*P. villosus,* Gm. Enl. 754; Wils. I, ix, 3;—*P. undosus,* N. Enl. 533;—*P. pubescens,* Gm. Catesb. 31, 11; Wils. I, ix, 4.

Species with a transversely striped beak: *P. moluccensis,* Gm. Enl. 748, f. 2;—*P. bicolor,* Ib. f. 1;—*P. rufus,* Gm. Enl. 694, f. 1, closely allied to the *P. undatus,* Gm.; Edw. 332;—*P. carolinus,* Gm. Enl. 597 and 692;—*P. caycnnensis,* Gm. Enl. 613;—*P. melanochloris,* Gm. Enl. 719;—*P. striatus,* Gm. Enl. 281 and 614;—*P. superciliaris,* T. Col. 443;—*P. flavescens,* Gm.; Brown, II, pl. xii, and Spix, 49;—*P. cardinalis,* Sonn., pl. xxxv;—*P. querulus,* Wils., Am. II, xv, 1;—*P. campestris,* Spix, 46;—*P. macei,* T. Col. 59, 2.

We should observe, that these distinctions of analogy, particularly when taken from colours, are but of little importance, and that it is very possible that among the above species, several may be found to constitute but one.

N.B. The *Picus auratus* has become the genus COLAPTES of Swainson.

between the Great and Little Spotted Woodpecker; black, spotted with white above; calotte of the male orange; that of the female, white.

We might also make a subgenus of those species whose slightly arcuated beak begins to approach the Cuckoos.(1) One of them always seeks its food on the ground, although its tail is similar to the others.(2)

Yunx, Linn.(3)

The Wrynecks have the protractile tongue of the Woodpeckers, which is also moved bv the same kind of mechanism, but the spines are wanting; their straight and pointed beak is nearly round, and without any angles; the quills of their tail are like those of birds in general. Their mode of life is that of the Woodpeckers, except that they climb but seldom. There is one of them in Europe.

Y. torquilla, L.; Enl. 698; Naum. 138. (The Common Wryneck.) The size of a Lark; brown above, prettily vermiculated with small blackish waves, and longitudinal fawn coloured and black streaks; whitish, transversely striped with black beneath. It derives its name from its singular habit, when surprised, of twisting its head and neck in opposite directions.

The Picumni, Temm. can scarcely be said to differ from the Wrynecks, except in their very short tail. They are very small birds,(4) some of which have but three toes like the Picoïdes.(5)

Cuculus, Lin.(6)

The Cuckoos have a middling, well cleft, compressed, and slightly arcuated beak; the tail, long. They live on insects, and are birds passage. We subdivide this numerous genus as follows:

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(1) Such as the *Picus auratus* (*Cuculus auratus* of the 10th Ed.) Enl. 695 and Wils. I, iii;—*Picus cafer*, Lath. or *proméipic*, Vaill. Prom. 32;—*P. poicilophos*, T. Col. 198, f. 1.

(2) *Picus arator*, Nob., Vaill. Afr. pl. cclv and cclvi.

The only additional abstraction that we make from the genus Picus, is the *P. minutus*, Lath. (*Yunx minutissimus*, Gm. Enl. 786, 1; Vicill. Gal. 28), which in fact is a Wry-neck.

(3) Yunx, the Greek name of this bird, Torquilla the Latin one.

(4) *P. minule*, T. (*Yunx minutissima*) Gm. Enl. 786, 1;—*P. à toupet* (*Picumnus cirrhatus*, T.) Col. 371, 1; Vicill. Gal. 28;—*P. mignon* (*P. exilis*, T.); Col. 571, 2.

(5) *P. abnormis*, T., Col. 371, 3.

(6) Κοκκυξ, cuculus, cuckoo, expresses the cry of the European species.

The True Cuckoos

Have a moderately strong beak, short tarsi, and ten quills in the tail. They are celebrated for the singular habit of laying their eggs in the nests of other insectivorous birds, and, what is not less extraordinary, these latter, which are often a considerably smaller species, take as much care of the young Cuckoo as of their own true offspring, and that too, even when its introduction has been preceded, which often happens, by the destruction of their eggs. The rationale of this phenomenon, which is unique in the history of birds, is unknown. Hérissant has attributed it to the position of the gizzard, which, in fact, is placed much farther back in the abdomen, and is less protected by the sternum than in other birds. The cæca are long, and the lower larynx has but a single muscle proper. There is one of them very generally found throughout Europe,

C. canorus, L.; Enl. 811. (The Common Cuckoo.) An ash coloured grey; white belly, striped transversely with black; sides of the tail spotted with white; a red takes the place of the grey in the young bird. But another species,

C. glandarius, Edw. 57; Naum. 130, the male; Col. 414, the female,(1) which is sometimes seen in Europe, has a more sonorous note, and is crested and spotted.

The warm countries of both hemispheres produce several others.(2)

Africa, in particular, has several beautiful species, of a green colour, more or less gilded; their beak is rather more depressed than that of the Common Cuckoo.(3)

In others, mostly spotted, the beak is vertically higher.(4) The

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(1) *Cuculus pisanus*, Gm. is the young.

(2) *Cuculus capensis*, Vaill. Afr. pl. 200, which is probably nothing more than a variety of the common one;—*solitarius*, Nob., Vaill. 206;—*radiatus*, Sonner. Voy. I, pl. 79;—*clamosus*, Nob. Vaill. 204, 205;—*edolius*, Nob. Vaill. 207, 208. N.B. *Cuc. serratus*, Sparm. Mus. Carls. 3, is the male; *melanoleucos*, Enl. 272, the female;—*coromandus*, Enl. 274, 2 and a var., Vaill. 213;—*americanus*, Enl. 816, or *carolinensis*, Wils. III, xxviii, 1;—*erythrophtalmus*, Ib., 2?—*flavus*, Enl. 814.

N.B. The *C mindanensis*, Enl. 277, and its male *C. orientalis*, Enl. 274, 1, are separated from them by M. Vigors and Horsf. under the generic name of Eudynamys.

(3) *Cuc. auratus*, Enl. 657, Vaill. 211;—*classii*, Vaill. 210;—*lucidus*, Lath. Syn. I, pl. xxiii, and Col. 102, f. 1;—*capreus*, Id. Supp. 134, and Vieill. Gal. 42;—*chalcites*, T. Col. 102, f. 2, the female.

(4) *Cuc. punctatus*, Enl. 771, and *scolopaceus*, 586, and perhaps even *maculatus*, 764, are varieties;—*honoratus*, Enl. 294, Vaill. 216;—*taitentis*, Sparm. Mus. Carls.

Couas, Vaill.

Only differ from the Cuckoos in their elevated tarsi.(1) They build in hollow trees, and do not lay their eggs in strange nests; a fact, so far as regards those species whose mode of breeding is known, that cannot be denied.

We may separate from them an American species with a long beak, that is only curved near the tip.(2)

M. Le Vaillant has already, and very properly, separated from the other Cuckoos the

Centropus, Illig.

Or the Coucals,(3) species of Africa and India, in which the thumb nail is long, straight and pointed, as in the Larks. Those which are known belong to the eastern continent. They also build in hollow trees.(4)

We should also distinguish with that naturalist, the

Courols,(5) or Vouroudrious of Madagascar,

In whose thick, pointed, straight and compressed beak, which is but slightly arcuated at the point of its upper mandible, the nostrils are pierced obliquely in the middle of each side. Their tail is composed of twelve quills. They live in the woods, and build like the preceding birds. They are said to be mostly frugivorous.(6)

32;—*mindanensis*, Enl. 277;—*gaira*, Vieill. Gal. 44; Freycin. Voy. Zool. 26. Why Vieillot makes an *Anis* of it, it is impossible to say.

(1) From this division Vieillot makes his genus Coccyzus, Gal. 41. It is the Macropus of Spix, *Cuc. madagascariensis*, Enl. 825;—*C. Lalandii*, T. Col. 440;—*cristatus*, Enl. 589; Vaill. 217;—*cæruleus*, 295, 2; Vaill. 218;—*nævius*, Enl. 812;—*cayanus*, Enl. 211;—*C. brachypterus*, T. or *Macropus caixana*, Spix, 43;—*C. scniculus*, Enl. 813;—*Macropus phasianellus*, Spix, 42.

(2) *Cuc. vetula*, Enl. 772. It is upon this distinction that Vieill. has founded his genus Saurothera, Galer. 38.

(3) *Coucal*, compounded of Cuckoo and Lark (Coc. and Alouette); *centropus*, feet with spurs. Vieill. has changed it into Corydonie, and Leach into Podophilus.

(4) *Cuculus ægyptius* and *senegalensis*, Enl. 332; Vaill. Afr. 219;—*philippensis*, Nob. Enl. 824, or *C. bubutus*, Horsf. Jav.;—*nigro-rufus*, Nob. Vaill. Afr. 220;—*tolu*, Enl. 295; Vaill. 219;—*bengalensis*, Brown, Ill. XIII;—*rufinus*, Nob., Vaill. 221;—*æthiops*, Nob. Vaill. 222;—*gigas*, Nob. Vaill. 223;—*atralbus*, Voy. de la Coq. Zool. 34.

(5) *Courol*, from *Cuckoo* and *Roller*. From this division Vieill. has made his genus Leptosomus, Gal. 29.

(6) *Cuculus afer*, Enl. 387, the male, whose beak is badly drawn, and 588, the female, where it is better, Vaill. 226, 227.

INDICATOR, Vaill.

The Indicators are also inhabitants of Africa, and, as they feed on honey, have become celebrated for guiding the natives to the retreats of the wild bees, which they seek with loud cries. Their beak is short, high, and nearly conical, like that of the Finch. Their tail of twelve quills is at once slightly cuneiform, and partly forked. Their singularly hard skin shields them from the stings of the bees, which, being continually persecuted, sometimes kill them by attacking their eyes.(1) The

BARBACOUS, Vaill.(2)

Have a conical, elongated beak, but little compressed, and slightly arcuated at the end, whose base is furnished with slender feathers or stiff hairs, which ally them to the Barbets.(3)

MALCOHA, Vaill.(4)

A very stout beak, round at base, and arcuated near the point, with a large naked space about the eyes. The nostrils of some(5) are round, and placed near the base of the beak, in others they are narrow and situated near its edge.(6) They are natives of Ceylon, and as it is said, live chiefly on fruit.

It is probable that we should distinguish those species in which the beak is not so stout, and which have scarcely any of the naked space about the eyes.(7)

SCYTHROPS, Lath.

The beak still longer and stouter than that of Malcoha, and

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(1) *Cuculus indicator*, Vaill. Afr. 241;—*minor*, Nob. Id. 24;—*albirostris*, T. Col. 367. Vieill. has adopted this name and genus, Gal. 45.

(2) *Barbacou*, composed of *barbet* and *cuckoo*. From it Vieill. has made his genus MONASIA, Gal. 36.

(3) *Cuculus tranquillus*, Enl. 512; Spix, 41, 2;—*C. tenebrosus*, Enl. 505, and Col. 323, 2;—*C. rufalbinus*, T. Col. 323;—*Monasa personata*, Vieill. Gal. 36, or *Bucco albifrons*, Spix, 41.

N.B. We should also observe, that the *Cuc. paradiseus*, Briss. IV, pl. xiv, A, 1, is the *Drongo de Paradis* (*Lanius malabaricus*), and that the *Cuc. sinensis*, Id. Ib. A, 2, is the *Corvus erythrorhynchos*. These two remarks are from Le Vaillant, who has done more to elucidate the history of the Cuckoos than any other naturalist.

(4) Vieill. calls the *Malcoha*, PHŒNICOPHÆUS, Gal. 37.

(5) The *Malcoha Rouverdin*, Vaill. Afr. 223.

(6) The *Malcoha*, Id., 224; or *Cuc. pyrrocephalus*, Forster, 3, Vieill. Gal. 37.

(7) The *Malcoha à bec peint* (*Phœnicophæus calyorhynchus*, T.) Col. 349;—*Phœni. javanicus*, Horsf., Jav.

grooved on each side with two shallow longitudinal furrows ; circumference of the eyes naked; nostrils round. These birds approach the Toucans in their beak; but their simple tongue, which is not ciliated, separates them. One species only is known, which is as large as a Crow, whitish, with a grey mantle; found in New Holland.(1)

Bucco, Lin.(2)

The Barbets have a thick conical beak, inflated on the sides of its base, and furnished with five bundles of stiff hairs directed forwards; one behind the nostril, one on each side of the base of the lower jaw, and the fifth under its symphysis. The wings are short, and their proportions are heavy, as is also their flight. They live on insects, and will attack small birds; they also eat fruit. They build in the hollows of trees. We may divide them into three subgenera:

The Barbicans, Buff.—Pogonias, Illig.(3)

Have one or two strong teeth on each side of the upper mandible, the ridge of which is blunt and arcuated; the hairs on the beak are remarkably rigid. They are more frugivorous than the other species, and are found in India and Africa.(4)

Bucco, Cuv.(5)

In the true Barbets, the beak is simply conical and slightly compressed, with a blunt ridge, somewhat raised in the middle. They are found in both continents, and several of them are ornamented with bright colours. During the nuptial season they fly in pairs, and the remainder of the year in small flocks.(6)

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(1) *Scythrops novæ-hollandiæ*, Lath. or *Scyth. australasiæ*, Sh., Philip. 165 and John White, p. 142; two bad figures. Those are better in Col. 290, and Vieill. Gal. 39.

(2) Bucco, the name given to this genus by Brisson, on account of the inflation of the mandible at its base, from *bucca* (cheek).

(3) Barbicans, because they are connected with both the Barbets and the Toucans: Pogonias, from πωγων, beard; but the latter has long been applied to a genus of fishes by *Lacépède*.

(4) *Bucco dubius*, Gm. (*Pogonias sulcirostris*), Leach, Zool. Misc. II, 76, Enl. 602; Vaill., Ois. de par. etc. II, pl. xix;—*Pog erythromelas*, Vieill. Gal. 32;—*P. levirostris*, Leach, 77; Vaill., pl. K; *Le barb. à ventre rose*, Vaill. loc. cit. pl. A, is its young;—*P. personatus*, T. Col. 201;—*P. niger*, Enl. 688, 1; Vaill., 29, 30, 31;—*P. rubicon*, Vaill. pl. D.

(5) Vieillot has changed this name into Capito.

(6) *Bucco grandis*, Enl. 871;—*viridis*, Enl. 870;—*flavifrons*, Nob. Vaill., I, cit. 55;—*cyanops*, Nob., Id., Ib., 21, or *Capito cyanocollis*, Vieill. Gal. 35;—*Lathami*,

Tamatia, Cuv.(1)

The extremity of the upper mandible of the beak, which is somewhat more elongated and compressed, is curved downwards. The large head, short tail and great beak of these birds give them a stupid appearance. All the known species are from America, and live on insects. Their natural disposition is sad and solitary.(2)

Trogon, Lin.(3)

The Couroucoui, along with the hairy fasciculi of the Barbets, have a short beak, which is more broad than high, and curved from the base, its upper ridge arcuated and blunt. Their small feet, feathered nearly down to the toes, long broad tail, fine light and dense plumage, give them quite a different air. Some part of their plumage usually has a metallic lustre, the remainder being coloured more or less vividly. They build in hollow trees, live on insects, and remain in a solitary and quiet mood on low branches in the centre of marshy forests, never being seen on the wing except during the morning and evening. They are found in both continents.

The edges of the mandibles, in the American species, are dentated.(4) In those of the eastern world, they are more entire.(5)

Lath., Syn. I, pl. xxii;—*philippensis*, Enl. 333;—*rubricapillus*, Brown, Ill., xiv;—*rubricollis*, Nob. Vaill. 35, should they not prove to be three varieties; *torquatus*, N., Vaill., 37;—*roseus*, N., Vaill., 33;—*niger*, Enl. 688, 1; Vieill. Gal. 33;—*mayanensis*, Lath.;—*elegans*, Gm. Enl. 618;—*barbiculus*, N., Vaill., 56;—*parvus*, Mas., Vaill., 32, female, Enl. 746, 2;—*erythronotos*, Nob. Vaill., 57;—*zeylanicus*, Brown, III, XV;—*cayanensis*, Enl. 206;—*peruvianus*, Nob. Vaill., 27;—*nigrothorax*, T., Vaill., 28, which may also prove three varieties;—*fuscus*, Vaill., 43;—*armillaris*, T. Col., 89, 1;—*gularis*, Id., Ib., 2;—*chrysopogon*, T. Col., 285;—*versicolor*, T. Col., 309;—*Mystacophanes*, T. Col. 315, Vaill. pl. C,—*auro-virens*, T., Vaill. pl. E.

(1) Tamatia, the Brazilian name of one of these birds, according to Marcgrave. In Paraguay, Azzara says, they are called *Chacurus*. It is to them that Temminck applies the term Capito.

(2) *Bucco macrorhynchos*, Enl. 689;—*melanoleucos*, Enl. 688, 2;—*collaris*, Enl. 395;—*tamatia*, Enl. 746, 1, Vieill. Gal. 34 (*Tamatia maculata*, Nob.);—*Cap. melanotis*, T. Col. 94;—*Cyphos macrodactylus*, Spix, 39, 2.

(3) *Curoucou* expresses their cry, and is their Brazilian name; that of *Trogon* was conferred on them by Mœhring.

(4) In America: *Trogon curucui*, Enl. 452, Vaill., *courouc*, 1, 2;—*Tr. rosalba*, Vaill. 6, or *variegatus*, Spix, 38;—*viridis*, Enl. 195, Vaill. 3, 4, Spix, 36;—*violaceus*, Nov. Comm. Petr. XI, pl. xvi, f. 8;—*strigilatus*, Enl. 765;—*rufus*, Enl. 736, Vaill. 9;—*Tr. atricollis*, Vieill. Gal. 31, or *oranga*, Vaill. 7, 8, 15, or *sulfuraceus*, Spix, 38;—*Tr. domicellus*, Vaill. 13;—*Tr. albiventer*, Vaill. 5.

(5) In Asia, *Trogon fasciatus*, Ind. Zool. pl. v;—*T. oreskios*, T. Col. 181;—*T. Reinwardii*, T. Col. 124;—*T. Duvaucelii*, T. Col. 291, Vaill. 14;—*T. condea*, T.

One of them is remarkable for the figure of its tail; *Tr. temnurus*, T., Col., 326; and another for the length of the tail coverts, which nearly equals that of the body, *Tr. pavonius*, T., Col. 372; Spix, 35. It is celebrated in the mythology of the Mexicans, and much in request among them for ornamental purposes.

Crotophaga, Lin.

The Ani(1) are known by their beak, which is thick, compressed, arcuated, entire, elevated, and surmounted with a vertical and trenchant crest.

Two species are known, both from the hot and low districts of America. Their tarsi are strong and elevated, the tail long and rounded, and the plumage black. *Crotophaga major*, and *Croto. ani*, Enl. 102, fig. 1 and 2, Vieill. Gal. 43.

These birds feed on insects and grain, and live in flocks, several couples laying their eggs, and even brooding over them in the same nest, which, together with the branches that support it, is of a size proportioned to the number of couples that have constructed it. They are easily tamed, and may be taught to speak, but their flesh has a disagreeable odour.

Ramphastos, Lin.(2)

The Toucans are easily distinguished from all other birds by their enormous beak, which is almost as thick and as long as their body, light and cellular internally, arcuated near the end, and irregularly indented along its edges; and by their long, narrow, and ciliated tongue. They are confined to the hot climates of America, where they live in small flocks, feeding on fruit and insects; they also devour other birds' eggs, and their callow offspring. The structure of their beak compels them to swallow their food without mastication. When they have seized it, they toss it into the air to swallow it with more facility. Their feet are short, and their wings have

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Col. 321;—*T. Temminckii*, Vaill. 12;—In Africa, *Tr. narina*, Vaill. Afr. 228, 229, and Cour. 10 and 11.

We may be allowed to doubt if the *Trogon maculatus*, Brown. Ill. XIII, be a true Couroucou.

(1) *Ani, Anno*, names of these birds in Guiana and Brazil. Crotophagus was formed by Brown (Nat. Hist. Jamaic.), from the circumstance of the Ani in that island flying on the cattle in pursuit of the Tabanus and the Tick. Κρότον, *musca canina*.

(2) *Toucan* from their Brazilian name *Tuca; Rhamphastos*, a name invented by Linnæus, from ῥάμφος, beak, on account of the enormous size of that organ.

but little extent; their tail is tolerably long. They build in the hollows of trees.

The Toucans, properly so called,

Have a beak larger than their head; they are generally black, with lively colours on the throat, breast, and rump. These parts of their plumage were employed, formerly, in a kind of embroidery.(1)

Pteroglossus, Illig.—Aracari, Buff.

The beak not so thick as the head, and invested with a more solid horn; their size is less, and the ground of their plumage green with some red or yellow on the throat and breast.(2)

Psittacus, Lin.

The Parrots have a stout, hard, solid beak, rounded on all sides and enveloped at base by a membrane in which the nostrils are pierced, and a thick fleshy and rounded tongue; two circumstances which give them the greatest facility in imitating the human voice. Their inferior larynx, which is complicated and furnished on each side with its three muscles, also contributes to this facility. Their vigorous jaws are set in motion by a greater number of muscles than is found in other birds. Their intestines are very long, and they have no cæcum. They feed on all sorts of fruit, climb among the branches of trees by the aid of their beak and claws, and build in hollow trees. Their voice is naturally harsh and disagreeable, and they are almost universally ornamented with the brightest colours, hardly any of them being found beyond the torrid zone. They exist however in both continents, the species of course differing in each. Every large island even has its peculiar species, the short wings of these birds not allowing them to cross any great extent of water. The Parrots, consequently, are very numerous: they are subdivided by the forms of their tails and some other characters.

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(1) *Ramphastos toco*, Enl. 82, Vaill. 2;—*carinatus*, Wagler, Edw. 329;—*tucanus*, Enl. 307;—*piscivorus*, L. or *Callorhynchus*, Wagler, Edw., 64;—*maximus*, Nob., Vaill. Touc. pl. vi;—*pectoralis*, Sh. or *Tucai*, Lich. Enl. 269;—*Aldrovandi*, Sh., Alb., II, 25;—*erythrorhynchos*, Sh., Enl. 262, Vaill. 3;—*Valiantii*, Wagler, Vaill. 4;—*Tocard*, Id. Vaill. 9;—*vitellinus*, Id. Vaill. 17, Swains. Zool. Ill. 56;—*dicolorus*, Wagler, or *chlororhynchos*, Temm. Vaill. 8.

(2) *Ramph. viridis*, Enl. 727, 728, Vaill. 16, 17;—*aracari*, Enl. 166, Vaill. 10, 11, Vieill. Galer. 30;—*piperivorus*, L. or *Culik*, Wagler, Enl. 577, 729, Vaill. 13 and 14;—*Pterogl. sulcatus*, Swains. Zool. Ill. 44, Col. 356;—*picatus*, Albin. II, 25;—*Azzaræ*, Vaill. Suppl. A;—*inscriptus*, Swains. Zool. Ill. 90;—*bailloni*, Vaill. 18;—*macalirostris*, Vaill. 15, and Suppl. AA.

Among those which have a long cuneiform tail, we first distinguish

ARA, Kuhl.

The Aras or Maccaws, whose cheeks are divested of feathers. They are American species, most commonly very large, and their plumage extremely brilliant, on account of which many of them are sent alive to Europe.(1)

The other long-tailed Parrots have the common name of

CORNURUS, Kuhl,

Or Paroquets. Le Vaillant divides them into the

ARA-PAROQUETS,

Which have a naked space round the eye; they inhabit America like the Ara:(2) and into the

ARROW-TAILED PAROQUETS,

Where the two middle quills extend far beyond the others.(3)

Such is the first species known in Europe, where it was brought by Alexander; *Psittacus Alexandri*, L., Enl. 642. It is of a fine green, with a red collar on the neck, and a black spot under the throat. The third subdivision of Le Vaillant is the

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(1) *Psitt. macao*, L., Vaill. 1;—*Ps. aracanga*, Enl. 12, Vaill. 2;—*Ps. tricolor*, Vaill. 5;—*Ps. hyacinthinus*, Lath., or *Anodorhynchus Maximiliani*, Spix, XI;—*Ps. ararauna*, Enl. 36;—*Ps. militaris*, Vaill. 4;—*Ps. severus*, Vaill. 8, 9, 10;—*Ps. macawuanna*, Enl. 864, Vaill. 7;—*Arara purpureo-dorsalis*, Spix, XXIV.

(2) *Ps. guyannensis*, Enl. 167, 407, Vaill. 14, 15;—*Ps. squamosus*, Shaw, Miscell. 1061;—*Ps. vittatus*, Vaill. 17;—*Ps. versicolor*, Enl. 144, Vaill. 16;—*Ps. solstitialis*, Vaill. 16—19, or *Aratinga chryso-cephalus*, Spix, XIV. His *Aratinga luteus* is a variety.

(3) It is this division which furnished MM. Vigors and Horsfield with their genus PALÆORNIS. We should place in it,

Ps. torquatus, Briss. Enl. 551;—*Ps. Alexandri*, L. Enl. 642, Vaill. 30; Edw. 292, the young of which, according to Kuhl, is *Ps. eupatria*, L., Vaill. 73, Enl. 239;—*Ps. annulatus*, Bechst. Vaill. 75, 76,—*Ps. erythrocephalus*, L., *gingianus*, Lath. Vaill. 45, Edw. 233;—*Ps. malaccensis*, Gmel.;—*Ps. barrabandi*, Swains. III, 59, or *barbulatus*, Bechst. Enl. 888, Vaill. 72;—*Ps. bengalensis*, Gm. Enl. 888, Vaill. 74;—*Ps. papuensis*, Sonner. Nouv., Guin., III;—*Ps. rufirostris*, Enl. 580;—*Ps. hæmatodus*, Enl. 61, or *cyanocephalus*, Enl. 192, or *moluccanus*, Enl. 743, or *cyanogaster*, Shaw, Gen. Zool., VIII, pl. lix, and J. White, p. 140, all varieties of age. MM. Vigors and Horsfield having observed in this last certain setæ under the tip of the tongue, erected it into a genus by the name of TRICHOGLOSSUS. It would be a matter of some interest to ascertain if many other Paroquets do not possess this same character.

PAROQUETS, with a tail widened near the end:(1)

And the fourth, that of the COMMON PAROQUETS, whose tail is equally cuneiform.(2) To these may be added, those species whose tail is square; the two middle quills of which are elongated, the lengthened part however being without barbs, except at the tip.(3)

Among the short and equal-tailed Paroquets we distinguish the

COCKATOOS.(4)

Marked by a crest formed of long and narrow feathers, placed on two lines, which can be raised or depressed at the will of the bird. They inhabit the most remote parts of India; the plumage of the greater number is white, and of all the different species they are the most docile. They prefer marshy grounds.(5)

There are some species lately discovered in New Holland, whose

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(1) *Ps. niger*, Enl. 500, Edw., 5;—*Ps. vasa*, Vaill. 51;—*Ps. mascarinus*, 3, Enl. 5, Vaill., 139;—*Ps. erythropterus*, Shaw, Nat. Miscell., 653;—*Ps. eximius*, Vaill. 28, 29, Sh. Misc. 93;—*Ps. Pennanti*, Lath., J. White, p. 174 and 175, or *elegans*, Gm. Vaill., 78, 79, or *gloriosus*, Shaw, 53;—*Ps. Brownii*, Kuhl, Vaill., 80;—*Ps. scapulatus*, Bechst. Vaill., 55, 56, Enl., 240;—*Ps. tabuensis*, Lath., or *atropurpureus*, Sh., Lev., Mus, 34;—*Ps. amboinensis*, Gm., Enl., 240, and J. White, p. 168, 169.

It is from this division that MM. Vigors and Horsfield have made their genus, PLATYCERCUS.

(2) *Ps. guaruba*, Kuhl, or *luteus*, Lath., Vaill. 20, or *Aratinga carolinæ*, Spix, xii;—*Ps. guyanensis*, Gm., or *macroguathos*, Spix, xxv;—*Ps. ludovicianus*, Enl. 499, or *carolinensis*, Wils., III, xxvi, 1;—*Ps. pertinax*, Enl. 528, Vaill. 34, 37;—*Ps. aureus*, L., Vaill., 41, Edw., 235;—*Ps. canicularis*, Enl. 767, Vaill., 40;—*Ps. æruginosus*, Edw., 177;—*Ps. buccalis*, Vaill. 67;—*Ps. virescens*, Enl. 359, Vaill. 59;—*Ps. sosova*, Enl. 456, 2, Vaill., 58, 59, and *Ps. tovi*, Enl. 190, 1;—*Ps. marinus*, Enl. 768, Vaill. 38;—*Ps. ponticerianus*, Enl. 517, Vaill., 31;—*Ps. xanthosomus*, Bechst., Vaill., 61;—*Ps. capistratus*, Bechst., Edw., 232, Vaill. 47;—*Ps. ornatus*, Enl. 552, Vaill. 52, Edw. 174;—*Ps. marginatus*, Vaill. 60, or *olivaceus*, Enl. 287;—*Ps. macrorhynchus*, Enl. 713, Vaill. 83;—*Ps. grandis*, Enl. 518 and 683; better, Vaill. 126, 127, 128;—*Ps. incarnatus*, Vaill. 46;—*Ps. borneus*, Vaill. 44;—*Ps. Novæ-Guineæ*, Vaill. 49;—*Ps. concinnus*, Vaill. 48;—*Ps. pusillus*, Vaill. 63;—*Ps. humeralis*, Vaill. 50;—*Ps. discolor*, V. 62;—*Ps. undulatus*, Sh. 673;—*Ps. chrysostomus*, Kuhl, pl. 1;—*Ps. pulchellus*, Vaill. 68;—*Ps. zonarius*, Sh. 657.

(3) *Ps. setarius*, Temm. Col. 15.

(4) Vieillot has named this division PLECTOLOPHUS.

(5) *Ps. cristatus*, Enl. 265;—*Ps. philippinarum*, Enl. 191;—*Ps. malaccensis*, Enl. 498;—*Ps. sulfureus*, Enl. 14;—*Ps. galeritus*, White, 237;—*Ps. nasicus*, T. Col. 331.

tufts are more simple, less mobile, and composed of broad feathers of a moderate length. They live chiefly on roots.(1)

In others, the crest merely consists of a few pendent feathers, furnished with slender barbs near the tips only, which form a kind of tufted bunch.(2)

But in the greater number, there is no crest whatever. The species best known for its aptness in learning to speak is,

Psitt. erythacus; Jaco; Enl. 311; Edw. 163; Vaill. 99—103. (The Grey Parrot.) Cinereous, with a red tail. From Africa.

The species with green plumage are the most numerous.(3)

The name of Loris has been applied to those species, the ground of whose plumage is red, which have a tail somewhat wedge-shaped, and which closely approach certain Paroquets. They are only found in the East Indies.(4) There are some small species with a very short tail, Psittaculus, Kuhl, which are also, but improperly, called Paroquets.(5)

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(1) *Ps. Banksii*, Lath., Syn. Supp. 109, Shaw, Misc. 50;—*Ps. funereus*, Shaw, Misc. 186;—*Ps. Cookii*, Tem., or *Leachii*, Kuhl, pl. iii;—*Ps. roseus*, Kuhl, Col. 81. This division has become the genus Calyptorhynchus of M. Vigors and Horsfield.

(2) *Ps. galeatus*, Lath., Suppl.

(3) *Ps. melanocephalus*, Enl. 527; Vaill. 119, 120;—*Ps. signatus*, Vaill. 105;—*Ps. menstruus*, Enl. 384; Vaill. 114, or *flavirostris*, Spix, xxxi;—*Ps. purpureus*, Enl. 408; Vaill. 115;—*Ps. sordidus*, Vaill. 104;—*Ps. amazonicus*, Enl. 13, 120, 312; Vaill. 98, 99;—*Ps. æstivus*, Enl. 547, 879; Vaill. 110 and 110 *bis*;—*Ps. cærulifrons*, Sh., Edw. 230; Vaill. 135;—*Ps. cyanotis*, Tem. or *brasiliensis*, Lin., Edw. 161; Vaill. 106;—*Ps. dominicensis*, Enl. 792, or *vinaceus*, Pr. Max., or *columbinus*, Spix, xxvii;—*Ps. Dufresnianus*, Kuhl, Vaill. 91;—*Ps. autumnalis*, Edw. 164; Vaill. 111; *Ps havanensis*, Enl. 360; Paill. 122;—*Ps. leucocephalus*, L., Enl. 335, 548, 549; Vaill. 107, 108, 108 *bis*, 109;—*Ps. albifrons*, Mus. Carls. 52;—*Ps. pulvcrulentus*, Enl. 861; Vaill. 92;—*Ps. festivus*, Enl. 840; Vaill. 129;—*Ps. accipitrinus*, Enl. 520, and Spix, xxxii, a;—*Ps. senegallus*, Enl. 288; Vaill. 116, 118;—*Ps. Levaillantii*, Lath., or *infuscatus*, Sh.; Vaill. 130, 131;—*Ps. gramineus*, Enl. 862; Vaill. 121;—*Ps. sinensis*, Edw. 231, Enl. 514, Vaill. 132;—*Ps. Geoffroii*, Vaill. 112, 113, or *Ps. personatus*, Sh.;—*Ps. xanthops*, Spix, xxvi;—*Ps. mitratus*, Pr. Max.; Col. 207, or *maïtaca*, Spix, xxix, and xxx;—*Ps. diadema*, Spix, xxxii.

(4) *Ps. unicolor*, Vaill. 125;—*Ps. domicella*, Enl. 119; Vaill. 94, 95;—*Ps. lori*, Enl. 158; Vaill. 123, 124;—*Ps. garrulus*, Enl. 216; Vaill. 96;—*Ps. cyanurus*, Sh., Vaill. 97.

(5) *Ps. passerinus*, Enl. 455, 1; Schaw., Misc., 893, and Spix, XXXIII;—*Ps. tui*, Enl. 456, 1; Vaill. 70;—*Ps. melanopterus*, Enl. 591, 1; Vaill. 69; Sh., 132;—*Ps. pilcatus*, Enl. 744; Vaill. 135;—*Ps. Barrabandi*, Vaill. 134;—*Ps. canus*, Enl. 791, 2; Sh. 425;—*Ps. swindernianus*, Kuhl, pl. ii;—*Ps. galgulus*, Enl. 190, 2;—*Ps. philippensis*, Enl. 520;—*Ps. vernalis*, Mus., Carls., 29;—*Ps. indicus*, Edw. 6;—*Ps. torquatus*, Sonner., N. Guin., 393;—*Ps. simplex*, Kuhl, Sonner., Ib. 38, 1;—*Ps. pullarius*, Enl. 60;—*Ps. micropterus*, Sonner, 41;—*Ps. taitianus*, Gm. Enl. 455, 2; Vaill. 65, or *Ps. porphyrus*, Sh. Misc. 7;—*Ps. sparmanni*, Mus., Carls., 27;

All this variety of size and colours can hardly authorise any generic distinctions. There are only the

PAROQUETS A TROMPE, Vaill.

Which possess characters sufficiently well marked to claim a separation from the others. Their short, square tail, and their crest composed of long and narrow feathers, assimilate them to the Cockatoos. Their cheeks are naked, as in the Ara, but their enormous upper mandible, and the very short lower one, which cannot be made to close, their cylindrical tongue, terminated by a small horny knob, split at the apex, and susceptible of being greatly protruded from the beak, their legs, naked a little above the heel, and finally, their short and flat tarsi on which they often rest in walking, distinguish them from all other Parrots. But two species are known, both natives of the East Indies.(1) A subgenus might also perhaps be made of the

PEZOPORUS, Illig.—PERRUCHES INGAMBES, Vaill.

Which have a weaker beak, more elevated tarsi, and straighter nails than the other parrots. They walk about on the ground, and seek their food among the grass.(2)

There are two African birds, closely allied to each other, and generally placed among the Scansoriæ, which appear to me to have some analogy with the Gallinaceæ, and especially with the Hoccos.

They have the tail and wings of the Hoccos, and like them perch on trees; the beak is short, and the upper mandible gibbous; there is a short membrane between the fore-toes, but the external one, it is true, is often directed backwards

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Vaill. 66;—*Ps. fringillaceus*, Vaill. 71, or *porphyrocephalus*, Sh. Misc., 1;—*Ps. phigy*, Vaill. 64;—*Ps. xanthopterigius*, Spix, XXXIV, 12;—*Ps. gregarius*, Spix, XXXIV, 3, 4.

(1) *Psittacus aterrimus*, Gm., or *Ps. gigas*, Lath. Edw. 316;—*Ps. goliath*, Kuhl, or *l'Ara noir à trompe*, Vaill. per. I, pl. xii and xiii;—*L'Ara gris à trompe*, Id. Ib. pl. ii, is perhaps a variety of the same. The name of *trompe* is not exactly correct. The tongue is not hollow, and in fact all that can be properly styled tongue is the little horny piece which invests the extremity of the cylinder. See Geoff. Saint-Hill. Ap. VI, Gal. 4.

From this subdivision M. Vieillot has made his genus MICROGLOSSUS, Galer. pl. 1.

(2) *Ps. formosus*, Vaill., I, 32; Sh. Misc., 228;—*Ps. Novæ-Zelandiæ*, Lath., Mus. Carls., 28;—*Ps. cornutus*, Lath., Syn. Supp. III, pl. viii.

like that of the Ululæ. Their nostrils, also, are simply pierced in the horn of the beak, the edges of the mandibles are dentated, and the sternum (at least that of the Touraco) has not those large emarginations, so common in the Gallinaceæ. There are two genera of these birds : the first is,

Corythaix, Illig.(1)

Or the Touracos, in which the beak does not mount on the forehead, and the head is furnished with an erectile tuft. The most common species,

Cuculus persa, L.; Enl. 601; Vaill., Prom., &c., 16 and 17, is found in the vicinity of the cape of Good Hope. It is a beautiful green, with part of the quills of the wings crimson. It builds in hollow trees, and feeds on fruit.(2) The second is the

Musophaga, Isert.

Or the Plantain-eaters, so called, because their principal food is the fruit of the banana. They are characterised by the base of the beak forming a disk, which partly covers the forehead. The species known is

M. violacea, Vieill. Galer. 47; *Touraco violet*, Vaill., Promer., &c., pl. 18. Circumference of the eyes naked and red; violet-coloured plumage; occiput and primary quills of the wings, crimson; a white line passes below the naked space round the eye. Inhabits Guinea and Senegal.

ORDER IV.

GALLINACEÆ.—Gallinæ, Lin.

These birds are so called from their affinity with the Domestic Cock, and like it, generally have the upper mandible arched, the

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(1) Vieillot has changed this name into Opæthus.

(2) Add the *Touraco-géant*, Vaill., Prom. and Guép., pl. 19;—the *Touraco Pauline*, Temm., Col. 23, or *Opæthus erythrolophus*, Vieill. Galer. 49;—the *Touraco brun* (*Phasianus africanus*, Lath.) Vaill., 20, or *Musophage varié*, Vieill. Galer. 48.

nostrils pierced in a broad membranous space at the base of the beak and covered by a cartilaginous scale; a heavy carriage, short wings, and the bony sternum diminished by two emarginations, so wide and deep that they occupy nearly the whole sides, its crest being truncated obliquely forwards, so that the sharp point of the fourchette is only joined to it by a ligament, circumstances which, by greatly impairing the strength of the pectoral muscles, render it difficult for them to fly. Their tail generally consists of fourteen quills, and sometimes of eighteen. The lower larynx is very simple, and consequently there is none of them that sings agreeably. They have an extremely large crop, and a very vigorous gizzard. With the exception of the Hocco, they all lay their eggs on the ground, on a few carelessly arranged blades of straw or grass. Each male usually has several females, and takes no sort of trouble either with the nest or the young ones, which commonly are very numerous, and most usually able to run as soon as they have left the shell.

This order is chiefly composed of one very natural family, remarkable for having furnished us with most of our domestic poultry, and abundance of excellent game; one in which the anterior toes are united at base by a short membrane, and indented along the edges, and which it is impossible to divide into genera, except by having recourse to characters of but little importance, drawn from some of the appendages of the head. In order, however, to avoid an excessive multiplication of beings, we will associate certain genera with them whose feet are deficient in that membrane, some of which, the *Pigeons*, connect the Gallinaceæ with the Passerinæ, while the others, the *Hoazins*, Buff., somewhat approximate to the Touracos.

Alector, Merr.(1)

The Hoccos are large Gallinaceæ of America, which resemble Turkeys, with a broad, rounded tail, formed of large and stiff quills.

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(1) Alector is the Greek name of the Cock.

There is a singular conformation in the trachea of several of them. They live in the woods, feed on buds and fruit, perch and build on trees, are very social and easily domesticated. Gmelin and Latham have divided them into Hoccos and Yacous, but upon very undeterminate characters. We subdivide them in the following manner.

THE HOCCOS, *properly so called*, Buff.—MITOUS, of Brazil, &c.—CRAX, Lin.

Have a strong beak, its base surrounded with a skin, which is sometimes highly coloured, in which the nostrils are pierced; on the head is a tuft of long, narrow, erect feathers, curled at the tips. They are the size of Turkeys, and like them fly up into trees. They are bred by the Americans; and individuals are sometimes sent to Europe, so variously coloured, that we are at a loss how to characterize their species. The most common, or

Crax alector, L.; *Mitou-Poranga*, Marcgr.; Buff. Ois., II, pl. xiii; Vieill. Galer., 199. Black; the lower part of the belly white; cera of the beak, yellow. The trachea makes but one slight curve before it enters the thorax. Some of these birds, such as

Crax globicera, L., Enl. 86; Edw., 295, 1, have a larger or smaller globular tubercle on the base of the beak. Among both of these species individuals are to be found in which the body is irregularly striped with white or fawn colour. Albin., II, 32.(1) The whole upper part is sometimes fawn coloured.(2) Those of Peru,

Crax rubra, L., Enl. 125, are all of a vivid chesnut colour above, the head and neck being variegated with black and white.(3)

OURAX, Cuv.

The Pauxi(4) have a shorter and thicker beak, the membrane of its base, as well as the greater part of their head being covered with a short and dense plumage resembling velvet. The most common species,

Crax pauxi, L.; *Pierre*, &c.; Enl. 78; Vieill. Galer. 200 (The Stone Bird), has an oval tubercle on the base of its beak, of a

(1) This appears to be the true Mexican *Hoazin* of Hernandez.

(2) Such is the female described by Azzara, Voy. IV, p. 169. From the accounts of other travellers, it appears that the females, also, are fawn coloured.

(3) See also *Crax fasciolata*, Spix, LXII, a;—*C. Blumenbachii*, Id, LXIV. Add, *Crax globulosa*, Id. LXV and LXVI;—*C. rubirostris*, Id., LXVII.

(4) *Pauxi* is the name by which Hernandez designates them. *Ourax*, the Athenian name for the Heath-Cock.

light blue colour and a stony hardness, almost as large as its head. It is black; the lower part of the belly and the tip of the tail, white. It lays its eggs on the ground. Its original habitat is not exactly known. The trachea descends externally along the right side to behind the sternum, where it inclines to the left, and ascends to enter the thorax, through the fourchette. All its rings are compressed.

There is another species, which, instead of the tubercle on the beak, has a red salient crest. The belly and tip of the tail are chesnut colour. It is the true *Mittu* of Marcgrave; *Ourax mittu*, Tem. Col. 153; *Crax galeata*, Lath.; *Crax tomentosa*, Spix, lxiii.(1)

Penelope, Merr.

The Guans or Yacous(2) have a slenderer beak than the Hoccos; the circumference of the eyes is naked, as well as the under part of the throat, which is generally susceptible of being inflated.

Several varieties of colour are found also among these birds, between which it is very difficult to establish specific limits. Those which have a tuft are sometimes of various shades of brown or bronze—*Penelope jacupema*, Mer. II, xi; sometimes spotted on the breast—*Penelope cristata*, L., Edw. 13;(3) sometimes black, with the same spots, and more or less white on the tuft and coverts of the wings—*Penelope leucolophos*, Merr. II, xii, or *Pen. cumanensis*, Gm.; Jacq. Beytr. pl. 10; Bajon, Cay., pl. 5, or *Pen. jacutinga*, Spix, pl. lxx. Some of them are intermediate between these two extremes,—*Pen. pipile*, Jacq. Beytr. pl. xi.

The trachea, at least in the first, descends under the skin far behind the posterior edge of the sternum, ascends, is again flexed, and then continues its course towards the fourchette, through which, as usual, it gains access to the lungs. A species almost without crest,

Pen. marail, Enl. 338, Vieill. Gal. 198, greenish-black, with

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(1) Add, *Crax tuberosa*, Sp. LXVII, a;—*Cr. uramutum*, Id., LXII. N.B. The *Chacamel*, Buff. (*Crax vociferans*) founded on a vague indication of Hernandez, cap. XLI, is not authentic. Sonnini even thinks it may be the *Falco vulturinus*. The *Caracara* of Buff. and Dutertre is the *Agami* (Psophia).

(2) *Gouan* and *Yacou* are the names of these birds in Guiana and Brazil. That of *Penelope*, given to them by Merrem, designated among the Greeks a species of Duck, which, according to them, had saved the wife of Ulysses from drowning when a child.

(3) The *P. jacuaza, jacucaca, jacupeba, jacubemba, guttata*, and *arra cuan*, of Spix, LXVIII—LXXV, closely approach the *P. cristata*, if they are not mere varieties of it. The *P. marail*, Vieill., Gal., 198, corresponds most with the *jacupeba*.

a fawn coloured belly, appears very distinct. Its trachea, in both sexes, forms a curve at the upper part of the sternum, just before it dips into the thorax.

Ortalida, Merr.

Or the Parraquas, only differ from the Yacous by having but little of the naked space on the throat, and about the eyes.

Only one species is known; of a bronze-brown above, whitish-grey beneath; top of the head red—*Catraca*, Buff.; *Phasianus motmot*, Gm., and *Phas. parraqua*, Lath., Enl. 146;(1) Bajon, Cay. pl. 1. The cry of this bird is very loud, and articulates its name. The trachea descends under the skin as low as the abdomen, and then ascends to enter the thorax.

With these different Hoccos naturalists usually associate the

Opisthocomus, Hoffmanseg.—Hoazin, Buff.(2)

An American bird of similar carriage, with a short and thick beak, the nostrils pierced in the horn, and destitute of membrane; the head ornamented with a tuft of long and very narrow and slender feathers, which is distinguished from all the true Gallinaceæ, by having no membrane between the base of the toes. It is the *Phasianus cristatus*, L., Enl. 337; Vieill. Galer. 193; greenish-brown, variegated with white above; front of the neck and tip of the tail fawn coloured; the belly chesnut. It is found perching along the margin of inundated places in Guiana, where it feeds on leaves and the seeds of a species of Arum. Its flesh smells strongly of castor, and is only employed as a bait for particular fishes.

Pavo, Lin.

The Peacocks are characterized by an aigrette or crest on the head, and by the coverts of the tail of the male being larger than its quills, and capable of being erected so as to form a circle. The shining, lax and silky barbs of these feathers, and the ocellated spots that decorate their extremities, are well known in the

P. cristatus, L.; *Paon domestique*, Enl. 433 and 434. (The

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(1) N.B. The fig. in the Pl. Enl. is bad, in as much as it represents the tail pointed.

(2) This term was applied to the above bird by Buffon, without any proof, from an indication of Hernandéz, Mex. 320, ch. 10.

Vieill. Galer., 193, calls it *Sasa cristata*, and improperly represents the beak as notched near its commissure. It forms a genus very distinct from that of any other of the Gallinaceæ, and when its anatomy is known, may become the type of a particular family.

Common Peacock.) A species in which the head is ornamented with an aigrette of vertical feathers widened at the tips. This superb bird, originally from the north of India, was introduced into Europe by Alexander. Its magnificent plumage is even surpassed in brilliancy by that of the wild ones. A rich blue supersedes the gold-green specks along their back, and on their wings; their tail also is more plentifully furnished with feathers.

The *Pavo spiciferus*, improperly styled by Linnæus *P. muticus*, for it also has spurs, is a distinct species. The feathers of its aigrette are long and narrow; its neck is not blue, but green, watered and gilt; the tail almost as magnificent as that of the common species.(1) Vieill. Galer. 202; Shaw, Nat. Misc. 641. Another species,

P. bicalcaratus and *thibetanus*, Gm.; *L'Eperonnier*, Enl. 492 and 493; Vieill. Galer. pl. 203 (The Chinquis), is much smaller, and has a short thick tuft on the head; each of the tarsi of the male is armed with two spurs; the coverts of the tail, which are not so long, are marked with double spots, and those of the scapulars with simple ones.(2) A neighbouring species, *Polypl. albocellatum*, T. is marked with simple blue spots, surrounded by a whitish circle. A third, *Pol. chalcurum*, T. has blue quills, but its coverts are only marked with fawn-coloured and black stripes.

Lophophorus, Tem.

The head surmounted with an aigrette similar to that of the Peacock, and a flat tail, the coverts of which are not prolonged, otherwise resembling the preceding birds in the lustre of the metallic colours of the male. The circumference of the eye, and even the cheeks, are naked as in the Pheasants, and the tarsi are armed with strong spurs. A species is known from the mountains of the north of India,

L. refulgens, T.; *Phasianus impeyanus*, Lath. Syn. Supp. pl. 114; *Monaul*, Sonnin.; Vieill. Gal. 208. Black; size of a Turkey; the aigrette and dorsal feathers of changeable colours, reflecting tints of gold, copper, sapphire, and emerald; quills of

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(1) It was only known, for a long time, by a bad drawing from Japan, in the sixteenth century, (Aldrov., II, av., 33, 34,) but Messrs Duvaucel and Diard having sent several of the birds from Sumatra to France, M. Vieillot has given his figure from them.

(2) M. Temminck makes a genus of it by the name of Polyplectrum; Vieillot has changed it into Diplectron.

the tail red. The young, and the female, are brown, dashed with grey and fawn-colour.(1)

Meleagris, Lin.(2)

The Turkeys have their head and upper part of the neck invested with a plumeless and papillated skin; an appendage under the throat, and another conical one on the forehead, which, in the male, when excited by passion, becomes so inflated and long, as to hang over the point of the beak. From the lower part of the neck of the adult male hangs a tuft or tassel of stiff hairs; the coverts of the tail shorter and stiffer than in the Peacock can be erected and displayed in the same way. The tarsi of the male are armed with weak spurs. But one species was known for a long time.

Meleagris gallo-pavo, L.; Enl. 97. (The Common Turkey.) Introduced into Europe from America in the sixteenth century. The size of this noble bird, and the goodness of its flesh, have rendered it extremely common. The Wild Turkey of America, Vieill. Gal. 201, is of a greenish brown, with a copper gloss. A second species, however,

M. ocellata, Cuv. Mem. Mus., VI, pl. 1; Col., 112, has lately been described, almost equal to the Peacock in the brilliancy of its colours, and particularly in the sapphire coloured spots, surrounded with circles of gold and ruby, which decorate the tail. It was captured in the bay of Honduras.

Numida, Lin. 3)

The Guinea-fowls, or Pintados, have a naked head, fleshy wattles at the bottom of the cheeks, a short tail, and the cranium generally surmounted with a callous crest. Their feet are without spurs; their short, pendent tail, and the quantity of feathers on the rump, give a spherical air to the body. The common species,

N. meleagris, L.; Enl. 108 (The Common Guinea-Hen), originally from Africa, has a slate-coloured plumage, every

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(1) Ælian appears to have previously known and described it, Hist., anno. L. XVI, c. 2. Add the *lophophore*, Cuv., Tem. Col. pl. 1, with a pendent crest, black body, and the edges of the dorsal feathers white; discovered by M. Duvaucel. It is, perhaps, the *Phasianus leucomelanos* of Lath. The female is brown, edges of the feathers on the breast whitish.

(2) Meleagris is the Greek name of the Guinea-Hen, erroneously applied by Linnæus to the Turkey.

(3) These birds were called Meleagrides by the ancient Greeks, who supposed them to have sprung from the metamorphosis of Meleager's sisters. They looked upon the spots on the feathers as traces of tears. The Romans called them African Hens, &c. They have been found no where by the moderns except in Guinea.

where sprinkled with small, white, round spots. Its noisy and quarrelsome disposition render it a very unwelcome guest in poultry-yards, although its flesh is excellent. In a wild state they live in large flocks, and prefer the vicinity of marshes. There are also two species,

N. cristata and *N. mitrata*, Pall., Spic., IV, pl. ii and iii, fig. 1; Vieill. Galer., pl., ccix, in the first of which the head is ornamented with a plumed crest, and in the second with a conical helmet. A third has lately been discovered in which the helmet is very small, and which has a small tuft on the base of the beak, composed of short stems, almost without barbs. *N. ptylorhyncha*, Licht. The great genus,

Phasianus, Lin.

Or that of the Pheasants, is characterized by the cheeks being partly destitute of feathers, and covered with a red skin, and by the tectiform tail, in which the feathers are variously disposed. We first distinguish,

Gallus,

The Cock, in which the head is surmounted with a vertical and fleshy crest, and each side of the lower mandible furnished with fleshy wattles. The quills of the tail, fourteen in number, are elevated on two vertical planes, placed back to back; the coverts of that of the male are extended into an arch over the tail proper. The species so common in our barn-yards,

Phas. gallus, L.; Enl. 1 and 49 (The Common Cock and Hen), varies infinitely as to colour, and even greatly as to size; in some races the crest is replaced by a tuft of feathers, or a top-knot; in others the tarsi, and even the toes, are feathered; in one race the crest, wattles, and periosteum of the whole skeleton are black, and in others, by a kind of monstrosity, we find five, and even six toes, for several generations.

Several species of wild Cocks are known. The first,

Gallus Sonneratii, Tem. Col., 232 and 233 (The Jungle Cock), was described by Sonnerat, Voy. II, Atl., 117, 118, and is very remarkable for the feathers on the neck of the male, the stems of which widen at the bottom into three successive disks of a horny nature. The crest is denticulate. It is found in the gauts of Hindostan.

Two others have been brought from Java by M. Lechenaud, one of which, *Gall. Bankiva*, Tem., has a denticulated crest like the preceding; all the feathers of the neck being long, pendent, and of the most beautiful golden red; it appears to me to bear

the greatest resemblance to our Domestic Cock. The other, *Phas. varius*, Shaw, Nat., Misc., 353; *Ajamalas; Gall. furcatus*, Tem. Col. 374, is black, with a cupreous-green neck, speckled with black; the crest entire, and a small kind of dewlap, without lateral wattles.

PHEASANTS, properly so called,

Have a long cuneiform tail, each of its quills being inclined on two planes, and covering each other. The most common,

P. colchicus, L.; Enl., 121, and 122 (The Common Pheasant of Europe), was brought into Europe by the Argonauts, as it is said, from the banks of the Phasis. It is now spread throughout all temperate Europe, where it requires, however, a great deal of care. The head and neck of the male are of a deep green, with two small tufts on the occiput; the rest of the plumage is of a golden fawn colour, speckled with green. The female is brownish, speckled and variegated with a darker brown.

China has lately furnished us with three other species, which, with the Peacock, form the ornaments of our aviaries, viz.

Ph. torquatus, which scarcely differs from the common one, except in having a brilliant white spot on each side of the neck.

Ph. nycthemerus, L. (The Silver Pheasant.) White, with very fine blackish lines on each feather, and the belly entirely black.

Ph. pictus, L. Enl. 217. (The Golden Pheasant.) So remarkable for its magnificent plumage; the belly is of a bright red; a beautiful crest of a golden colour hangs from the head; the neck is clothed with a collerette of orange, speckled with black; the upper part of the back is green, the lower part of the rump yellow; the wings red, with a beautiful blue spot; the tail very long, brown, spotted with grey, &c. It appears to me that Pliny's description of the Phœnix, lib. x, cap. 2, was taken from this beautiful bird.

The females of all these species have shorter tails than the males, and the plumage variously marked with different shades of grey or brown.(1)

One of the most singular of all birds is,

Ph. Argus, L.; *L'Argus*, Vieill., Galer., pl. cciii. (The Argus.) A large Pheasant from the south of Asia, whose head and neck are nearly naked. The tarsi are without spurs; a very long tail to the male; the secondary quills of the wings excessively elongated, widened, and covered throughout with ocel-

(1) Add the *Faisan versicolor,—Phas. Diardi*, Tem., discovered by Messrs Diard and Duvaucel, Vieill. Gal. pl. ccv.

lated spots, which, when spread, give to the bird a most extraordinary aspect. It inhabits the mountains of Sumatra, and of some other countries of the south east of Asia. It forms the genus Argus, Tem., Gallin.

There is reason to believe that a bird exists in the interior of China, the feathers of whose tail are still more elongated, attaining a length of four feet, whitish, changing to red on the edges, with numerous tranverse black or maronne lines. It is thought to be figured on some of the Chinese paper hangings. M. Temminck calls it *Phasianus superbus;* Gall. II, p. 336. The

Houppiferes, Tem.,

With the naked cheeks common to this genus, have the vertical tail and arched coverts peculiar to the Cock, and feathers on their head which they can erect, forming an aigrette similar to that of the Peacock. The inferior edge of the naked skin on the cheeks, which is salient, supplies the place of wattles. The tarsi are armed with strong spurs.

Only one species is kuown; it is from the straits of Sunda, is the size of a Cock, of a brilliant black, with a golden red rump; the two superior tail-coverts yellowish or whitish, the flanks spotted with white or fawn-colour; *Phas. ignitus*, Sh. Nat. Misc., 321; Vieill., Galer., pl. ccvii. The female is brown, finely striped with black above, and dashed with white beneath. She has also a crest.

Tragopan, Cuv.

The head of the male most fantastically ornamented; it is almost naked, and behind each eye is a small slender horn; a wattle under the throat susceptible of inflation; the tarsi of both sexes armed with short spurs.

Only one species is known, a native of the north of India, the *Nepaul* or *Faisan cornu*, Buff.; *Penelope satyra*, Gm.; *Meleagris satyrus*, Lath. Edw. 116; Vieill., Galer. 206. As large as a Cock; of a brilliant red, sprinkled with small white tears. The female and the young are of different shades of brown.(1)

We should separate from the Pheasants the

Cryptonyx, Tem.(2)

In which the nakedness of the head is confined to the circum-

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(1) The *Tragopan* of Pliny, lib. x, c. 49, was probably imagined from this bird.

(2) Vieillot has changed this name into Liponyx.

There is a species of *Cryptonyx* at Malacca, mentioned by Dussumier, which is black, crestless, and without the papillated space about the eye.

ference of the eye; the tail is moderate and plane, and the tarsi without spurs; the principal character, however, consists in the absence of the thumb nail.

There is only one species well known, the male of which has a long tuft of slender red feathers, and long upright filaments, without barbs on each eye-brow. It is the *Rouloul de Malacca*, Sonner. Voy. II, pl. 100; *Cript. coronatus*, Tem., Col. 350 and 351; *Columba cristata*, Gm. and Lath.; *Phasianus cristatus*, Sparm., Mus. Carls. III, 64. Green; somewhat larger than a Quail. The female, which merely has a vestige of a tuft, is the *Tetrao viridis*, Lath., Syn. II, pl. 67.(1)

Tetrao, Lin.

This also is a great genus, characterized by a naked and most generally red band, which occupies the place of the eye-brow. It is divided into subgenera as follows.

Tetrao, Lath.

The feet of Grous are covered with feathers, and are without spurs. Those to which this name is more particularly applied have a round or forked tail and naked toes. There are two large species of them in France.

T. urogallus, L.; *Grand Coq de Bruyéres;* Enl., 73 and 74. (The Great Heath-Cock.) The largest of all the Gallinaceæ, and superior in size to the Turkey. Its plumage is slate-coloured, transversely and finely striped with black; the female is fawn-coloured, the cross lines brown or blackish. Found in the heart of mountain forests, builds among the heath-grass, or in newly cleared grounds, and feeds on berries and buds. Its trachea makes two curves before it dips into the lungs. The flesh is delicious.

T. tetrix, L.; *Coq de Bouleau;* Enl. 172 and 173; Frisch, 109; Naum. 1st Ed., 18, f. 37 and 38. (The Black Cock.) The male is more or less black, with some white on the coverts of the wings and under the tail, the two forks of which diverge laterally. The female is fawn-coloured, transversely striped with blackish and whitish. Their size is that of the Cock, and they are found in mountain forests.

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(1) The *Columba cristata*, B., Gm., Lath., Syn. II, pl. lviii, appears closely allied to it; but the figure represents it as having a large nail to the thumb. This is perhaps an error, as in the Galer. Vieill, tom. II, pl. ccx.

An intermediate species appears to exist in the north of Europe,—*T. intermedius*, Langsdorf, Mém. de Petersb., tom. III, pl. xiv; Sparm. M. Carls., pl. xv, which is larger than the preceding, with the tail less forked, and the breast spotted with white. Found in the marshy districts of Courland, Ingria, &c.(1)

In the woods of temperate Europe we find,

T. bonasia, L.; *La Gelinotte; Poule des Coudriers;*(2) Enl. 474 and 475; Frisch. 112; Naum. 20, f. 39. (The Hazel Grous.) Which is but a little larger than the Partridge, and is prettily variegated with brown and white, grey and red; a large black band near the tip of the tail; throat of the male black, and his head slightly tufted.(3)

America produces some neighbouring species, such as

Tet. canadensis and *canace*, L.; *Gelinotte noire d'Amer.*, Enl. 131 and 132; Edw. 118 and 71. Brown, verging more or less on a black; tip of the tail red.

In some, the feathers on each side of the neck of the males are turned up like a mantlet, or two scrolls: their habits have an affinity with those of the Turkey. Such are,

Tetr. umbellus and *togatus*, Gm.; *Coq. de Bruy. à fraise*, Enl. 104; Edw. 248; Wils. pl. xlix; called *Partridge* in New England, and *Pheasant* in Pennsylvania. Variegated with red, grey, and black; a large black spot at the bottom of the neck, on each side; a black band edged with white on the tip of the tail; lower part of the tarsi naked. Found in the mountain forests; the voice of the male in the nuptial season resembles the roll of a drum.

Tetr. cupido, Gm., Catesb. Suppl. 1; Wils, pl. xxvii; Vieill. Galer. 219. (The Pinnated Grous.) Variegated with brown and fawn colour; tail brown; tarsi feathered down to the toes; the feathers on the bottom of the male's neck turn up into two pointed scrolls, beneath which is a naked skin, which, in the

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(1) It appears to be at once the *Tétras à plumage variable*, and the *Tétras à queue pleine*, of Buffon.

(2) Bonasia, or Bonasa, name of the Gelinotte in Albertus Magnus and other authors of the middle ages.

(3) The *Attagas* of Buff., *Attagen* of Aldrov., Ornith., II, p. 75; *Gelinotte huppée*, Briss., appears to me after much research, even in Italy, to be nothing more than a young or female Gelinotte. It is the same individual painted by Frisch, pl. cxii. The *Tetrao canus*, Gm. (Sparm. Mus. Carls., p. 16) is only an albino variety of the Gelinotte. Neither have I any confidence in the authenticity of the *Tetr. nemessianus*, nor in that of the *Tetr. betulinus* of Scopoli. They are females, or the young of the *Tetr. tetrix*, or disfigured Gelinottes.

genial season, he inflates like a bladder; his voice sounds like a trumpet. Found on extensive plains, and is such delicious food that laws have been passed to preserve the breed.(1) The name of

LAGOPUS,

Or Ptarmigan, is more particularly applied to those species which have a round or square tail; whose toes are feathered as well as the legs. The most common become white in winter.

Tetr. lagopus, L.; *Lagopède ordinaire*,(2) Enl. 120 and 494; Brit. Zool. pl. M, 3, M, 4; Naum. 1st Ed. Supp. 61, f. 115, 116. (The Ptarmigan or White Grous.) Its summer plumage is fawn coloured, marked with small black lines.(3) From high mountains, where it remains during the winter, in holes which it forms under the snow.

Tetr. albus, Gm., called of Hudson's Bay; *T. saliceti*, Tem., Edw. 72; Frisch, 110, 111. (The White Ptarmigan.) From the whole north; is larger, and its summer plumage more red; its belly remains white.(4)

There is a Ptarmigan in Scotland, however, which does not change its plumage in winter; it is,

Tetr. scoticus, Lath.; *Poule de marais; Grous*, &c. Albin. 1, 23, 24; Brit. Zool. pl. M, 3; Vieill. Galer. 221. (The Red Ptarmigan.) Above, variegated with fawn colour, brown and black; a deep red, striped with blackish beneath; legs cinereous, and but few feathers on the toes.

We may separate by the name of

GANGA OR ATTAGEN.(5)—PTEROCLES, Tem.

Those species which have a pointed tail and naked toes. The circumference of their eyes only is naked, but it is not of a red colour; their thumb is very small.

Tetr. alchata, L.; *Ganga*, Enl. 105 and 106; Edw. 249.(6) The size of a Partridge; the plumage scalloped with fawn co-

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(1) Add *Tet. urophasianus*, Bonap. III, pl. xxi, f. 2;—*Tet. obscurus*, Bonap. III, pl. xviii. *Am. Ed.*

(2) LAGOPUS—hare's foot, hairy foot—is the ancient name of this bird.

(3) In this summer livery it is the *Tetr. rupestris*, Lath.

(4) The summer plumage forms the *Tetr. lapponicus*, Lath.

(5) *Attagen*, the Greek name of a heavy bird, somewhat larger than the Partridge, with the plumage of a Woodcock, probably designated the Ganga.

(6) *Ganga* is its Catalonian name; *Alchata*, or rather *Chata*, its name among the Arabs.

lour and brown; the two middle quills of the tail much elongated and terminating in a point; throat of the male, black. Found in the south of France, and all round the Mediterranean.(1)

Perdix, Briss.

Partridges have the tarsi naked like the toes. Among them the

Francolinus, Tem.

Is distinguished by a longer and stronger beak; a larger tail, and, generally speaking, by stout spurs. The south of Europe produces one,

Tetrao francolinus, L.(2) Enl. 147, 148; Edw. 246. With red feet; neck and belly of the male, black, with round white spots; a bright red collar.(3)

Some of these birds foreign to Europe are remarkable for a double spur,(4) or for the naked skin of their throat.(5) In others these characters are united,(6) and in certain large beaked species the spurs are altogether wanting.(7) The

Common Partridges

Have a somewhat weaker beak; the spurs of the males are either short, or mere simple tubercles; they are deficient in the female.

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(1) Add of those species which have filaments to the tail, *Tetr. senegalus*, or *Pterocles guttatus*, Tem., Enl. 130, and the female 345;—*Pterocles exustus*, Tem. Col., 354 and 360:—Of those whose tail is simply pointed, *Tetr. arenarius*, Pall., Nov. Com. Petrop., XIX, pl. viii, or *Pterocles arenarius*, Col. 52 and 53, the same as the *Perdix arragonica*, Lath.;—*Pterocles Lichtensteinii*, T. Col. 355 and 361. The male 355 is at all events closely allied to the *Tetr. indicus*, Lath.; Sonner. II, 96;—*Pterocles coronatus*, Tem. Col. 339 and 340;—*Pterocles quadricinctus*, Tem. or *Oenas bicinctus*, Vieill. Galer. 220;—finally the largest species, the *Tetr. fasianellus*, Gm. or Long-tailed Gelinotte of Hudson's Bay, Edw. 117.

(2) *Francolino*, the name of the blind made for the purpose of killing the bird whose appellation it bears, is applied in Italy to several species, such as the Gelinotte and this one.

(3) Add the *Tetrao ponticerianus*, Sonner. Voy. II, 11, 165, Tem. Col. 213;—*perlatus*, Briss., pl. xxviii, A, fig. 1; Vieill. Galer. 213; the same as the *madagascariensis*, Sonn. II, 166, pl. xcvii.

(4) *Tetrao bicalcaratus*, L., Enl. 137;—*Perdix Clappertoni*, Rupp., pl. ix, can hardly be said to differ from it;—*spadiceus*, Sonn. II, 169;—*zeilonensis*, Ind. Zool. pl. xiv.—The *Perdix cruenta*, Tem. Col. 322, has three and even four spurs, and bright colours foreign to the rest of the genus.

(5) *Tetrao rubicollis*, Enl. 180.

(6) *Tetrao nudicollis*.

(7) *Tetrao javanicus*, Brown, Ill., xvii, (a bad figure); there is a better one, Col. 148, under the name of *Pedrix ajanham*, Temm.

Tetrao cinereus, L.; Enl. 27; Frisch, 114; Naum. 1st Ed. pl. 3, f. 3. (The Grey Partridge.) Beak and feet ash coloured; head fawn coloured; the plumage of various shades of grey; a maronne spot on the breast of the male. This common bird, which constitutes so important an item in the luxuries of the tables of Europeans, lives and builds in their fields.

Tetr. rufus, L.; Enl. 150. (The Red Partridge.) Beak and feet red; brown above; flanks speckled with red and cinereous; throat white, surrounded with black; prefers the hills and rising grounds. The flesh is white and dry. The south of France produces

Perdix græca, Briss.; *Per. saxatilis*, Meyer; *La Bartavelle*, Enl. 231; Frisch. 116. Which only differs from the Red Partridge in its superior size and more ash coloured plumage. It is found along the great mountain ranges.(1)

Coturnix.

Quails are smaller than Partridges, with a slenderer beak and shorter tail; no red eye-brow nor spurs. Every one knows

Tetrao coturnix, L.; Enl. 170; Frisch, 117; Naum. 4, f. 4. (The Common Quail.) Back brown, waved with black; a pointed white stripe on each feather; throat brown, eyebrows whitish; Found in the fields of Europe, and celebrated for its migrations; during which this heavy bird finds means to cross the Mediterranean.(2) The

Partridges and Quails of America

Have a stouter, shorter, and more convex beak; the tail is somewhat larger.(3) They perch on bushes, and, when disturbed, even on trees. Several of them migrate like the Quails of Europe.

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(1) Add the *Red Partridge of Barbary*, a very distinct species, (*Tetr. petrosus*, Gm.) Edw., 70;—the *Perdrix de montaigne*, (*Tetrao montanus*), Enl. 136, Frisch. 114, B, is only, according to Bonnelli, a variety of the Grey Partridge;—the *Perdrix de haye*, Tem. Col. 328 and 329;—*Perd. personata*, Horsf. Jav.;—*Perd. à gorge rousse* (*Perd. gularis*, T.);—*Perd. oculea*, Id.;—*Perd. fusca*, Vieill. Gal. 212.

(2) Add the *petite Caille de la Chine* (*Tetr. chinensis*, L.), Enl. 126, F, 2, of which the *Tetr. manillensis*, Gm., Sonner. Voy. I, pl. xxiv, is the female;—the *Caille australe* (*Perd. australis*, T.), Vieill., Galer. 215;—the *Caille nattée* (*Perd. textilis*, Temm.), Col. 35;—the *Tetr. coromandelicus*, Sonner. II, 172;—*T. striatus*, Sonner., II, pl. xcxviii, and Temm. Col. 82, very different from that of Lath. Syn. II, pl. lxvi;—the *Pedrix de gingi* (*Tetr. gingicus*), Sonner. II, p. 167, also appears to belong to this subgenus.

(3) Among the species, the size of the Partridge, we may remark the *Tocro*, or *Perdrix de la Guiane*, Buff. (*Tetr. guyanensis*, Gm.) or *Perd. dentata*, Tem. or

It is impossible to avoid separating from the whole genus Tetrao the

TRIDACTYLES, Lacép.—HEMIPODIUS, Tem.,

In which the thumb is wanting, and whose compressed beak forms a little projection under the lower mandible. They cannot, however, be properly classed until their anatomy is better known. They are polygamous, and inhabit sandy districts. Some of them, the

TURNIX, Bonnat.—ORTYGIS, Illig.

Have still all the appearance of Quails; their toes are completely separated down to the very base, and are without the small membranes.

The natives of Java use one species for fighting, as Cocks are used in England; it is the *Hemip. pugnax*, T., Col. 602.(1) Others, such as the

SYRRHAPTES, Illig.,

Are so far removed from the general type of the Gallinaceæ, that we are tempted to doubt the propriety of placing them in this order. Their short tarsi are covered with feathers as well as the toes, which are also very short and partly united; their wings are extremely long and pointed.

One species only is known, and that is from the deserts of central Asia—*Tetrao paradoxus*, Pall., Voy., Fr. Trans. 8vo, tom. III, pl. 1, page 18; Vieill. Galer., pl. 222; the *Heteroclite*, Tem., Col., pl. 95.

Odontophorus rufus, Vieill. Galer. pl. ccxi, which is not a *Tinamou*, as Gmelin asserts. Among those the size of the Quail : *Tetrao mexicanus*, Enl. 149, Frisch. II. the same as *marylandicus*, Albin. I, xxviii, and as *virginianus*, or *Perdix borealis*, Vieill. Galer. 214;—*Tetr. Falklandicus*, Enl., 222;—*Tetr. cristatus*, Enl. 126, f. 1;—the *Colin Sonnini* (*Perd. Sonnini*, T.) Col. 75, and Jour. de Phys., II, 217, and pl. 2;—the *Colin à aigrette de Californie*, *Tetr. californius*, Sh., Nat. Misc. IX, pl. 345, and Atl. Voy. de la Peyrouse, pl. xxxvi;—the *Perd. rousse-gorge* (*Perd. cambayensis*, Tem.) Col. 447;—*Perd. australis*, Vieill. Gal. 215.

(1) Add *Tetrao nigricollis*, Enl. 171;—*Tetr. andalusicus*, Lath., Syn. II, part 2, fig. of the title page;—*Tetr. luzoniensis*, Sonn. Voy. I, pl. xxiii;—*Hemipodius nigrifrons*, Tem. III, 610, and Vieill. Gal. 218;—*Hemip. thoracicus*, Tem. III, 622, or *Turnix maculatus*, Vieill. Gal. pl. 217;—*Hemip. Meiffrenii*, T. Col. 60, 1, of which Vieill., Gal. 300, makes his genus TORTICELLE, and places it among the Waders, inasmuch as the lower part of the tibia is without feathers;—the *Hemip. nivosus*, Swains. Zool. Ill., 163, must also belong to it;—the *Tetr. suscitator*, or *Réveil-matin* of Java is also a Turnix. See Bontius, Med. Ind. p. 65.

It is equally necessary to separate from Tetrao, the

Tinamus, Lath.—Crypturus, Illig.—Ynambus, Azz.(1)

Or the Tinamous, a genus of American birds very remarkable for a slender and long neck, (although their tarsi are short) covered with feathers, the tips of whose barbs are slender and slightly curled, which gives a very peculiar air to that part of their plumage. The beak is long, slender, and blunt at the end; somewhat arched, with a little groove on each side; the nostrils are pierced in the middle of each side, and penetrate obliquely backwards. Their wings are short, and they have scarcely any tail. The membrane between the base of the toes is very short. Their thumb, reduced to a spur, cannot reach the ground. The circumference of the eye is partly naked. They either perch on low branches of trees, or hide among tall grass; they feed on fruits and insects, and their flesh is good. Their size varies from that of the Pheasant down to that of the Quail, some of them are even still smaller.

One portion of them,—Pezus, Spix, is still furnished with a small tail concealed under the feathers of the rump.(2)

In the other—Tinamus, Spix, every vestige of a tail is annihilated.(3) Their nostrils are placed a little farther back.

We should distinguish the Rynchotus, Spix, whose beak, which is stronger, has no groove, and is slightly arcuated and depressed; the nostrils are pierced near the base.(4)

Columba, Lin.

The Pigeons may be considered as forming a slight transition from the Gallinaceæ to the Passerinæ. Like the former, their beak is vaulted, the nostrils perforated in a broad membranous space, and

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(1) Except his *Choro*, which is a Gallinula, and his *Uru*, which is the *Tocro* already spoken of among the Partridges.

(2) *Tetr. major*, Gm., or *Tin. brasiliensis*, Lath., or the *Tin. magoua*, Tem.; Buff. Enl. 476, and much better, Hist. des Ois., IV, 4to, pl. xxiv; it is the *Pezus serratus*, Spix;—*Tetr. cinereus;*—*Tetr. variegatus*, Enl. 328, from which the *Tin. undulatus*, T., or *Cryptura sylvicola*, Vieill. Gal. 216, can differ but little;—*Tin. apequia* (*T. obsoletus*, Tem.) Col. 196;—*Tin. tataupa*, Swains. Ill. 19, or *T. plumbeus*, T. Col. 196, or *Pezus niamba*, Spix, 78, a;—*Tinamus noctivagus*, Pr. Max., or *Pezus zabele*, Sp., 77;—*Tin. macaco* or *vermiculé* (*T. adspersus*, T.), Col. 369, or *Pezus vapura*, Sp. 78;—*Tetr. sovi*, Gm., or *Tin. sovi*, Lath. Buff., Enl. 829.

(3) *Tin. inambui*, Azz. (*T. maculosus*, I.), or *T. major*, Sp., 80;—*T. medius*, Spix, 81;—*T. boraquira*, Sp. 79;—*T. carape*, (*T. pavoninus*, T.) of which the *Tinam. minor*, Sp. 81, appears to be the female. These three species are very similar.

(4) The *Tinamou isabelle* (*T. rufescens*, T.), Col. 412; or *Rhinchotus fasciatus*, Spix, 76.

covered with a cartilaginous scale, which even forms a bulge at the base of the bill; the bony sternum is deeply and doubly emarginated, although somewhat differently; the crop extremely dilated, and the lower larynx furnished with but a single proper muscle; but there is no other membrane between the base of their toes than that which results from the continuity of the edges. Their tail is composed of twelve quills. They fly well, live in a state of monogamy, build on trees or in fissures among rocks, and lay but few eggs at a time, generally two; it is true they lay frequently. The male assists his mate in the business of brooding. They nourish their young by disgorging macerated grain into their crop. They form but one genus, which naturalists have attempted to divide into three subgenera, from the greater or less strength of the bill and the proportions of the feet. The

Columbi-Gallines, Vaill.

Approximate to the ordinary Gallinaceæ still more than the other subgenera, by their more elevated tarsi and their habit of living in flocks, seeking their food on the ground, and never perching. Their beak is thin and flexible.

One species is even allied to the Gallinaceæ by the caruncles and naked portions of skin that distinguish its head; it is the *Columba carunculata*, Tem. pl. 11; *Columbi-galline*, Vaill. 278.

A second is at all events connected with them by its size, which about equals that of the Turkey; it is the *Crowned Pigeon* of the Archipelago of India; *Goura*, Tem.; *Colombihocco*, Vaill.; *Col. coronata*, Gm.; Sonn. 104; Enl. 118; Tem., Pigeons, pl. 1; Vieill., Galer. 197. Altogether of a slate-blue, with some chesnut and white on the wing; the head ornamented with a vertical tuft of long slender feathers. It is bred in the poultry yards at Java, &c., but does not propagate in Europe.(1)

A third claims an alliance with them, from the long pendent feathers which ornament its neck, like that of the Cock. It is the *Pigeon de Nincombar; Col. nincombarica*, L.; Enl. 491, and is of the most brilliant golden-green, with a white tail. Found in several parts of India.(2) The

Columbæ,

Or Common Pigeons, have shorter feet than the preceding birds,

(1) This large Crowned Pigeon constitutes the genus *goura*, or Lophyrus of Vieill. Galer. pl. 197.

(2) Species placed in this genus which are not, perhaps, sufficiently deter-

but the same thin and flexible beak. Four wild species are found in Europe.

Col. palumbus, L.; *Le Ramier*, Enl. 316. (The Cushat.) Is the largest, and inhabits the forests, preferring those of Pines, &c. It is ash-coloured, more or less blue; breast of a vinous red, and is distinguished by white spots on the sides of the neck and on the wing.

Col. œnas, L.; *Le Colombin;* Frisch, 139. (The Stock Dove.) A slate-grey, the breast vinous; sides of the neck a changeable green; somewhat smaller than the preceding, but has similar habits.

Col. livia, Briss.; *Biset* or *Pigeon de roche;* Enl. 510. (The Rock Dove). Slate-grey; circumference of the neck a changeable green; a double black band on the wing; rump, white. This species is the parent stock of our Common Pigeon, and most probably of all our innumerable domestic races, in whose production the mixture of some neighbouring species may also have had some influence.

Col. turtur, L.; *Tourterelle;* Enl. 394. (The Turtle Dove.) A fawn coloured mantle spotted with brown; neck bluish, with a spot on each side speckled with white and black. The smallest of the wild, European species. It inhabits the woods.

Col. risoria, L.; *Rieuse;* Enl. 244; Frisch, 44; Tem. 44. (The Ring Dove.) Appears to be originally from Africa. It is of a flaxen colour, paler beneath; a black collar round the neck.(1)

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mined: *Columba cyanocephala*, Enl. 174, Vaill., 281; Tem. 3;—*Col. montana*, Edw. 119; Tem. 4;—*Col. martinica*, Enl. 141, 162; Vaill. 282; Tem. 5 and 6;—*Col. erythrothorax*, Tem. 7;—*Col. cruenta*, Sonn. 20, 21; Tem. 8 and 9;—*Col. jamaïcensis*, Tem. 10;—*Col. talpacoti*, Tem. 12;—*Col. passerina*, Enl. 243, 2, Catesby, 26;—*Col. minuta*, Enl. 243, 1;—*Col. hottentotta*, Tem., Vaill. 283;—*Col. cobocola*, and *Col. griseola*, Spix, LXXV, 2.

N.B. The *C. passerina* and *squamosa* form the genus Chamæpelia of Swainson; the *C. cinerea*, T., the genus Peristera, and the *C. migratoria*, the genus Eotopistes.

(1) Other Columbæ with a square or round tail, *Col. spadicea*, Tem. 1;—*Col. ænea*, Enl. 164, Tem. 3 and 4; Voy de Freycin., 29, of which, according to Temminck, *Col. pacifica* is the male;—the *Col. océaniquc*, Less. and Garn. Voy. de Duperre, is a neighbouring species;—*Col. arcuatrix*, Vaill. Afr.; Tem. 5;—*C. armillaris*, Tem. 6;—*C. littoralis*, Sonn. 103; Tem. 17;—*C. chalcoptera*, Tem. 8;—*C. cristata*, Tem. 9;—*C. caribæa*, Tem. 10;—*C. leucocephala*, Catesb. 65; Tem. 13;—*C. speciosa*, Enl. 213; Tem. 14;—*C. corensis*, Tem. 15;—*C. guinca*, Edw. 75; Vaill. Afr. 265; Tem. 16;—*C. madagascariensis*, Enl. II; Vaill. Afr. 266; Tem. 17;—*C. gymnophtalmos*, Tem. 18;—*C. Franciæ*, Sonner. 101; Tem. 19;—*C. rubri-capilla*, Sonner. 57; Tem. 20;—*C. elegans*, Tem. 22;—*C. cincta*, Tem. 23;—*C. rufina*, Tem. 24;—*C. leucoptera*, Edw. 76; Tem. 25;—*C. javanica*, Enl. 177; Tem. 26; Sonner. 66;—

The species of this division are numerous, and may be still more subdivided, according to the greater or less nudity of their tarsi, and from the naked space found round the eyes of some of them.(1)

Some have even caruncles, and other naked parts on the head. Such is the *Col. auricou; Col. auricularis*, Tem., 21.

We can also separate some species with pointed tails.(2)

But the best of all the divisions that have been made among the Pigeons, is that of,

VINAGO, Cuv.—COLUMBARS, Vaill.(3)

Known by the bill, which is thicker, formed of a solid substance, and compressed on the sides; the tarsi are short, the feet wide and well bordered. They all feed on fruit, and inhabit forests. But few species are known, all of which are from the torrid zone of the eastern continent.(4) Some of them have a pointed tail.(5)

C. jamboo, Tem. 27 and 28;—*C. violacea*, Tem. 29;—*C. melanocephala*, Enl. 214; Tem. 30;—*C. larvata*, Vaill. Afr. 269; Tem. 31;—*C. holosericea*, Tem. 32;—*C. sinica*, Albin. III, 46;—*C. viridis*, Enl. 142;—*C. erythroptera*, Temm. 55;—*C. mystacea*, T. 56;—*C. superba*, T. 33;—*C. tympanistria*, Vaill. 272, Tem. 36;—*C. cærulca*, T. 37;—*C. afra*, Enl. 160; Vaill. 271; Tem. 38 and 39;—*C. Geoffroy*, T. 57;—*C. cinerea*, T. 58, and the female, Col. 260;—*C. bitorquata*, T. 40;—*C. vinacea*, T. 41;—*C. tigrina*, Sonner., 102;—*C. cambayensis*, Vaill. 270; T. 45;—*C. malabarica*, *Col. brame*, T.;—*C. alba*, Tem. 46;—*C. squamosa*, T. 59;—*C. malaccensis*, Mus. Carls. 67; Edw. 16; Tem. 47;—*C. macroura*, Enl. 329;—*C. porphyrea*, Tem. Col. 106;—*C. dilopha*, T. Col. 162;—*C. magnifica*, T. Col. 163;—*C. locutrix*, Pr. Max.; Col. 166;—*C. leucomela*, T. Col. 186;—*C. scripta*, T. Col. 187;—*C. Dussumieri*, T. Col. 188;—*C. leucotis*, T. Col. 189;—*C. xanthura*, Cuv.; Col. 190;—*C. picturata*, T. Col. 242;—*C. sperspicillata*, Col. 246;—*C. luctuosa*, Reinw.; Col. 247;—*C. hyogastra*, R.; Col. 252;—*C. monacha*, R.; Col. 253;—*C. humilis*, T. Col. 258;—*C. pinon*, Quoy and Gaym., Voy. Freycin., 28;—*C. pampusan*, Ib. 30;—*C. araucana*, Less. and Garn. Voy. de Duperr. 40;—*C. cyanovirens*, Ib. 42;—*C. Zoæ*, Ib. 29.

Add, *Col. fasciata*, Bonap. I, pl. lxxvii, f. 3;—*Col. zenaida*, Bonap. II, pl. xv, f. 2. *Am. Ed.*

(1) M. Swains. calls PTILINOPUS those species which have feathered tarsi, such as the *C. purpurata*, T. Col. 34, &c.

(2) *Col. migratoria*, Enl. 176; Frisch, 142; Tem. 48 and 49;—*Col. carolinensis*, Ib. 175; Tem. 50; Catesb. 24; Edw. 15;—*Col. Reinwartii*, Tem. Col. 248;—*C. humeralis*, Ib. 191;—*C. amboinensis*, Ib., 100;—*C. lophotes*, Ib. 142;—*C. venusta*, Ib. 341, 1, or *Col. strepitans*, Spix, lxxv, 1;—*Col. dominicensis*, Ib. 487; Tem. 51;—*Col. capensis*, Ib. 140, &c.; Vaill. 273, 274; Tem. 53, 54;—*C. Maugei*, Tem. 52;—*Col. macquaria*, Quoy and Gaym., Voy. de Freyc., 31.

(3) *Vinago*, the Latin name of the *C. ænas*—Vieill. has changed it into TRERON.

(4) *Col. abyssinica*, or Wallia of Bruce, Vaill. 276, 277; Tem. 8 and 9;—*Col. australis*, Enl. 3, Tem. 3;—*Col. aromatica*, Enl. 163; Tem. 57; Brown, Zool. Ill. 20;—*Col. vernans*, Enl. 158; Tem. 10 and 11;—*Col. militaris*, Tem. 1 and 2;—*C. psittacea*, Tem. 4;—*C. calva*, Tem. 7;—*C. olax*, T. Col. 241;—*C. Capelei*, Ib. 143.

(5) *Col. oxyura*, T. Col. 240.

ORDER V.

GRALLATORIÆ.—Grallæ, Lin.

The birds of this order derive their name from their habits, and from the conformation which causes them. They are known by the nudity of the lower part of their legs, and most generally by the height of their tarsi; two circumstances which enable them to enter the water to a certain depth without wetting their feathers; to wade through it and seize fish by means of their neck and bill, the length of which is usually proportioned to that of the legs. Those which are furnished with a strong bill, feed on fish and reptiles; while such as have a weak one, consume worms and insects. A very few feed partially on grain, and they alone live at a distance from rivers, &c. The external toe is most commonly united at its base with that of the middle one, by means of a short membrane; sometimes there are two similar membranes, and at others they are entirely wanting, and the toes are completely separated; it sometimes also happens, though rarely, that they are bordered all along, or palmated to the very end; in fine, the thumb is deficient in several genera; circumstances, all of which have an influence on their mode of life, which is more or less aquatic. Almost all these birds, the Ostriches and Cassowaries excepted, have long wings, and fly well; during which action they extend their legs backwards, differing in this from all others, which fold them under the belly.

In this order we establish five principal families, and some insulated genera.

FAMILY I.

BREVIPENNES.

These birds, although similar in general to the other Grallatoriæ, differ from them greatly in one point—the shortness of the wings, which renders flight impossible. The beak

and regimen give them numerous affinities with the Gallinaceæ.

It appears as if all the muscular power which is at the command of nature, would be insufficient to move such immense wings as would be required to support their massive bodies in the air. The sternum is a simple buckler, and is deficient in that ridge which is found in all other birds. The pectoral muscles are thin and delicate, but the posterior extremities regain what the wings have lost—the muscles of the thighs, and of the legs in particular, being enormously thick and stout.

The thumb is always deficient.(1) They form two genera.

Struthio, Lin.

The Ostriches have wings furnished with loose and flexible feathers, but still sufficiently long to increase their speed in running. Every one knows the elegance of these slender-stemmed plumes, the barbs of which, although furnished with little hooks, always remain separate, contrary to what takes place in most other birds. Their beak is horizontally depressed, of a moderate length, and blunt at the end; their tongue short, and rounded like a crescent; their eye large, and the lid fringed with lashes; their legs and tarsi very long. They have an enormous crop, a large sac between the crop and gizzard, voluminous intestines, long cæca, and a vast reservoir in which the urine accumulates as in a bladder, being the only birds which can be said to urine. The penis is very large, and is frequently exposed.(2)

But two species are known, each of which might form a separate genus.

Struthio camelus, L.; Enl. 457.(3) (The Ostrich of the Eastern Continent.) But two toes, the external of which is one half shorter than its fellow, and has no nail. This bird, so highly celebrated from the earliest ages, abounds in the sandy deserts of Arabia and Africa. It attains the height of six or eight feet, lives in great troops, lays eggs, each weighing nearly three

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(1) The number of the phalanges is as follows, commencing with the internal toe :

Ostrich, 4, 5:

Nandou and Cassoway, 3, 4, 5:

Which amounts to the numbers common among birds.

(2) For the genito-urinary organs of birds, and those of the Ostrich in particular, consult the Mém. of Geoffroy Saint-Hillaire, Mém. du Mus., tom. XV.

(3) See also the beautiful figure drawn by Maréchal in the Menag. du Mus. of Lacep. and Cuvier, copied Vieill. Galer. pl. 223.

pounds, which, in very hot climates, it is contented with exposing in the sand to the warmth of the sun, but over which, out of the tropics, it broods with great care, defending them courageously every where. The Ostrich feeds on grass, grain, &c., and so obtuse is its sense of taste that it swallows pebbles, pieces of iron, copper, &c. When pursued it dashes stones behind it with great violence. No animal can overtake it in the race.

Struth. rhea, L.;(1) *Nandou, Churi*, &c., Hammer. An. Mus. XII, xxxix; Vieill. Galer. 224. (The American Ostrich.) Is about one half smaller, with more thinly furnished feathers, of a uniform grey colour, and particularly distinguished by its three toes, all having nails. Its plumage is greyish, browner on the back: a black line along the back of the neck in the male. It is as common in the southern parts of South America, as the preceding one is in Africa. When taken young, it is easily tamed. Several females, it is said, lay in the same nest, or rather the same hole, yellowish eggs, which are hatched by the male. It is only eaten when very young.

Casuarius, Briss.

The Cassowaries have wings still shorter than those of the Ostrich, and totally useless, even in running. There are three toes to all the feet, each furnished with a nail; the barbs of their feathers are so poorly provided with barbulæ, that at a distance they resemble pendent hairs. Two species are known, each of which might also constitute a genus.

Struthio casuarius, L.; *Emeu*,(2) Enl. 313, and better Frisch, 105.(3) (The Cassowary.) The beak laterally compressed; head surmounted by a bony prominence, covered with a horny substance; skin of the head and top of the neck naked, of an azure-blue and a fiery red colour, with pendent caruncles like those of the Turkey; some stiff stems in the wings, without barbs, which the bird uses as weapons in combat; nail of the internal toe much the strongest. It is the largest of all birds, next to the Ostrich, and differs considerably from it in its anatomy, for

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(1) Brisson and Buffon, following Barrère, have improperly applied to it the name of *Touyou*, or rather of *Touiouiou*, which belongs to the Jabiru. It is the genus *Rhea* of Brisson. The Portuguese of Brazil have transferred to it the name of *Emeu*, which properly belongs to the Cassowary.

(2) *Cassuwaris*, the Malay name of this bird. *Eme*, or *Emeu*, its peculiar appellation in Banda.

(3) There is also an excellent figure of it by Maréchal in the Menag. du Mus. copied Vieill. Galer. pl. 225.

its intestines are short, and the cæca small; the intermediate stomach between the crop and gizzard is wanting, and its cloaca is not larger in proportion than that of other birds. It feeds on fruit and eggs, but not grain. The female lays a small number of green eggs, which like the Ostrich she abandons to the solar heat. Found in different islands of the Archipelago of India.

Cas. Novæ-Hollandiæ, Lath.; Voy. de Péron, Atl. part 1, pl. xxxvi; Vieill. Galer. pl. 226.(1) (The Cassowary of New Holland.) A depressed beak; no helmet on the head; a little naked skin about the ear; plumage brown and more of it; more barbs to the feathers; no caruncles, or spurs on the wing; nails of the toes about equal. Its flesh resembles beef. Its speed is greater than that of the swiftest greyhound. The young ones are striped with brown and black.(2)

FAMILY II.

PRESSIROSTRES.

This family comprises genera with long legs, without a thumb, or in which the thumb is too short to reach the ground. The bill is moderate, but strong enough to penetrate the earth in search of worms; hence we find those species in which it is weakest frequenting meadows and newly ploughed grounds to obtain that sort of food with more facility. Such as have stronger beaks, also feed on herbs, grain, &c.

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(1) This constitutes the genus Emou, or Dromaius of Vieillot.

(2) N.B. I cannot allow room in this work for species so little known, and even so poorly authenticated, as those which form the genus Didus of Linnæus.

The first, or the *Didus ineptus*, is only known from a description drawn up by the first Dutch navigators, and given by Clusius, Exot., p. 99, and from an oil painting of the same period, copied by Edwards, pl. 294; for the description of Herbert is puerile, and all others are copied from Clusius and Edwards. It seems that the species has completely disappeared, nothing remaining of it at the present day but a foot preserved in the British Museum (Shaw, Nat. Misc. pl. 143), and a head in very bad condition possessed by the Asmolean Museum of Oxford (Id. lb. pl. 166.) The beak bears some resemblance to that of the Penguins, and the foot, if it were palmated would be like that of the Aptenodytes.

The second species, *Didus solitarius*, rests on the bare testimony of Leguat, Voy. I, p. 98, a man who has disfigured well known animals, such as the Hippopotamus and the Lamantin.

The third, *Didus nazaremus*, is only known from the account of François

Otis, Lin.

The Bustards, in addition to the massive carriage of the Gallinaceæ, have a long neck and legs, and moderate beak; its superior mandible being slightly arcuated and arched, which, as well as the very small membranes between the base of the toes, again recal the idea of the Gallinaceæ. But the nakedness of the lower part of their legs, their whole anatomy, and even the flavour of their flesh, place them among the Grallatoriæ, and as they have no thumb, the smaller species approximate closely to the Plovers. Their tarsi are reticulated, and their wings short; they fly but seldom, hardly ever using their wings, except to assist themselves in running. They feed indifferently on grain and herbs, worms and insects.

O. tarda, L., Enl. 245. (The Great Bustard.) Back, of a bright fawn colour, crossed with numerous black streaks, the remainder greyish. The feathers of the ears of the male, which is the largest bird in Europe, are lengthened out on both sides, forming a kind of large mustachios. This species, which is considered as being among the best game of that country, frequents its extensive plains, building on the ground among the grain.

O. tetrax, L.; Enl. 25 and 10. (The Little Bustard.) More than a half smaller, and much less common than the tarda; brown above, sprinkled with black; whitish beneath; neck of the male black, with two white collars.

The beak of most species foreign to Europe is more slender than that of those which belong to it. Among the former we may remark,

O. houbara, Gm.; *Le Houbara*, Desfontaines, Acad. des Sc., 1787, pl. x; Vieill. Galer., pl. ccxxvii. (The Houbara.) So called on account of the ruff of elongated feathers which ornaments both sides of its neck. From Africa and Arabia.(1)

Cauche, who considers it to be the same as the *ineptus*, giving it however but three toes, while all the others allow the former to possess four. No one has been able to obtain a sight of any of these birds since the time of the above named travellers.

Of all birds, that which has its wings the most completely reduced to a simple vestige, is the *Apteryx*, represented by Shaw, Nat. Misc. 1055 and 1057. Its general figure is that of an Aptenodytes, its size that of a Goose. The feet would be those of the former, were they not described as wanting the web. The beak is very long, slender, marked with a longitudinal groove on each side, and having a membrane at base. The wing is reduced to a little stump, terminated by a hook. From New Holland.

(1) I leave among the Bustards all Latham's species, such as the *Afra*, Lath.

Charadrius, Lin.(1)

The Plovers have no thumb; the beak is moderate, compressed, and enlarged at the point.

They may be divided into two subgenera; viz.

Œdicnemus, Tem.(2)

In which the end of the beak is inflated above as well as beneath, and the fossæ of the nostrils only extend half its length. They are larger species which prefer dry and stony places, and feed on snails, insects, &c. They have some affinity with the smaller species of Bustards. Their feet are reticulated, and there is a short membrane between each of their three toes.

Œdic. crepitans, Tem.; *Charadrius œdicnemus*, L.; *Courlis de terre;* Enl. 919; Frisch, 215; Naum. Ed. I, 9, f. 13. (The Thick-knee.) Size of a Woodcock; a fawn coloured grey, with a brown streak on the middle of each feather; white belly; a brown streak under the eye.(3)

Charadrius, Cuv.

The beak of the True Plovers is only inflated above, and has two-thirds of its length occupied by the nasal fossæ, which render it weaker. They live in large flocks, and frequent low grounds, where they strike the earth with their feet, in order to set in motion the worms on which they feed.

The species of France are only found there, in transitu, during the autumn and in the spring: near the sea coast, some of them remain until the beginning of winter. Their flesh is excellent, and with various other species, they form a tribe with reticulated legs, the most remarkable of which are:

Char. pluvialis, L., Enl. 904; Frisch, 216; Naum. I, c. 10, f.

Syn. II, pl. lxxix;—the *benghalensis*, Edw. 250;—the *Arabs*, Id. 12;—but I withdraw the *Œdicnemus*, which, on account of its compressed beak, enlarged at the end, begins the following genus.—Add, *Otis nuba*, Rupp. pl. 1;—*Ot. denhami;*—*Ot. torquata*, Cuv., a new species from the Cape.

(1) *Charadrius*, the Greek name of a nocturnal aquatic bird, comes from χαραδρα. Gaza translates it by *Hiaticula.*

(2) *Œdicnemus* (swelled leg), a name invented by Belon for the Thick-knee.

(3) Add the *Œdicnème tachard* (*Œd. maculosus*, Cuv.) Col. 292;—the *Œd. à longs pieds* (*Œd. longipes*, Geoff.,) Vieill. Gal. 228, or *Œd. echasse*, Tem. Col. 386;—the *Œd. à gros bec* (*Œd. magnirostris*, Geoff.), Col. 387, might, from the form of its beak, be placed at the head of a particular series to which would belong a closely allied species with a slightly recurved upper mandible: *Œd. recurvirostris*, Cuv.:—*Char. crassirostris*, Spix, 94.

14; Wils. VII, lix, 5. (The Golden Plover.) Blackish; the edges of its feathers dotted with yellow; white belly. It is the most common of all, and is found throughout the whole globe. The north produces one which scarcely differs from it except in its black throat; it is the *Char. apricarius*, Edw. 140; Naum. II, f. 15; Wils. VII, lvii, 4. Some authors assert it is the young of the other.

Char. morinellus, L.; *Le Guignard*, Enl. 832; Naum. 12, f. 16, 17. (The Dotterel.) Grey or blackish; feathers edged with fulvous-grey; a white streak over the eye; breast and upper part of the belly of a bright red; lower part of the belly white.

Char. hiaticula, L.; *Pluvier à collier*, Enl. 920; Frisch, 214; Brit. Zool. pl. P; Wils. V, xxxvii, 2. (The Ring Plover.) Grey above; white beneath; a black collar round the lower part of the neck, very broad in front; the head variegated with black and white; bill, yellow and black. Three or four species or races are found in France differing in size, and in the distribution of the colours on the head.(1) This same distribution, with but little variation, is found in several species foreign to Europe.(2)

Many Plovers have scutellated legs; they form a small division, most of its species having spines to their wings, or fleshy wattles on the head; some of them have both these characters.(3)

Vanellus, Bechst.—Tringa, Lin.(4)

The Lapwings have the same kind of beak as the Plovers, and are

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(1) *Ch. minor*, Meyer, Enl. 921; Wils. VII, lix, 3; Naum. 15, f. 19, or *Ch. curonicus*, Lath., with an entirely black beak;—*Ch. cantianus*, Lath., or *albifrons*, Meyer, of which the *Ch. ægyptius* may possibly be the female. Its collar is interrupted.

(2) *Char. vociferus*, Enl. 286; Wils VII, lix, 6;—*Char. indicus*, Lath.;—*Char. Azarai*, T., Col. 184;—*Char. melanops*, Vieill., Gal. 235, or *Ch. nigrifrons*, Cuv. Col. 47, 1;—*Char. Wilsonii*, Wils. IX, lxiii, 5.—Add, of closely allied species, although without collars: *Ch. peeuarius*, T. Col. 183;—*Ch. nivifrons*, Cuv.;—*Char. ruficapillus*, T. Col. 47, 2;—*Ch. monachus*, Tem.;—*Ch. griseus*, Lath.

Add *Ch. semipalmatus*, Wils. VIII, pl. lix, f. 3;—*Ch. melodus*, Wils. V, pl. xxvii, f. 3. *Am. Ed.*

(3) Species with unarmed, scutellated feet: *Char. coronatus*, Enl. 800;—*Ch. melanocephalus*, Enl. 918, Savigny, Egypt., Ois., pl. vi, f. 4, of which Vieillot makes his genus Pluvianus, Gal. pl. xxiii—its beak is somewhat stouter than the others. Armed species: *Char. spinosus*, Enl. 801;—*Ch. cayanus*, Enl. 833. Species with wattles: *Char. pileatus*, Enl. 834;—*Ch. bilobus*, Enl. 880.

The *Char. cristatus*, Edw. 47, appears to be the same as the *spinosus*.

(4) *Tringa*, or rather *Trynga*, the Greek name of a bird the size of a Thrush, which frequents the shores of rivers, and is constantly moving its tail, Arist. It

only distinguished from them by the presence of a thumb; but it is so small that it cannot reach the ground.

In the first tribe, that of the Lapwing-Plovers, (Squatarola, Cuv.) it is even scarcely visible. It is distinguished by the bill, which is inflated underneath, and its nasal fossa being short like that of an Œdicnemus. The feet are reticulated: all those of France have the tail striped with white and black, forming, as is asserted, but one species whose great diversity of plumage has occasioned its multiplication. It is always found with the Plovers.

Tringa squatarola; Le Vanneau gris, Enl. 854. (The Grey Lapwing.) Greyish above, whitish with greyish spots beneath, is the young bird before it has moulted. The *Variegated Lapwing*, (*Tringa varia*,) Enl. 923, white, spotted with greyish; blackish mantle dotted with white, comprises the two sexes in their winter plumage. The *Vanneau suisse*, (*Tringa helvetica*, Enl. 853, Naum. Ed. I, 62, f. 117,) black and white spots above, black beneath from the throat to the thighs, is the male in his wedding livery.

Vanellus, Cuv.

The true Lapwings have a rather more decidedly marked thumb, the tarsi scutellated, at least partially so, and the nasal fossæ extending two-thirds the length of the beak. They are equally as industrious in the pursuit of worms as the Plovers, procuring them in the same manner.

The European species, *Tringa vanellus*, L., is a pretty bird, as large as a Pigeon, of a bronze-black, with a long and slender crest. It arrives in France in the spring, lives in the fields and meadows, builds there, and departs in autumn. The eggs are considered a great delicacy.(1)

Warm climates also have some species of this bird, whose wings are armed with one or two spurs, and others which have caruncles or wattles at the base of the beak: their tarsi are scutellated. They are very noisy animals, screaming out at every sound they hear. They live in the fields, and defend themselves against birds of prey with much courage.(2)

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was Linnæus who applied it thus; but he placed many other birds in his genus *Tringa*, besides the Lapwings, the Sandpipers, (Calibris, Cuv.,) especially.

(1) Add the *Vanneau à écharpe* (*Vann. cinctus*), Less. and Garn. Voy. Duperr. pl. xliii;—Le *V. à pieds jaunes* (*Vann. flavipes*), Savigny, Egypte, Ois., pl. 6, f. 3.

(2) They are the first nine species of Parra, Gmel., particularly *Parra cayennensis*, Enl. 836;—*P. goensis*, Enl. 807;—*P. senegalla*, Enl. 362, or better *Vanellus albicapillus*, Vieill., Gal. 236;—*P. ludoviciana*, Enl. 835, from which *Vann. gallinaceus*, Tem., does not perhaps specifically differ, &c.; their habits, legs, beak,

Hæmatopus, Lin.

The Oyster-catchers have a somewhat longer beak than the Plovers or the Lapwings; it is straight, pointed, compressed into a wedge, and sufficiently strong to enable them to force open the bivalve shells of the animals on which they feed. They also seek for worms in the earth. The nasal fossæ, which are very deep, are only half the length of the beak, the nostrils resembling a small slit in the middle. Their legs are of a moderate length, their tarsi reticulated, and their feet divided into three toes.

Hæmatop. ostralegus, L.; Enl. 929; Brit. Zool., pl. D; Catesb. I, 85, is the European species, also called *Pie de mer* on account of its plumage, which is black; the belly, throat, base of the wings and tail being of a fine white. The white on the throat disappears in summer. It is about the size of a Duck; bill and feet, red.

There is a species in Brazil with a longer bill, and no white under the throat, the *Hæm. palliatus*, Tem., which Wils. VIII, lxiv, 2, confounds with the common one; another in the Malouines, where the black extends farther down on the breast, the *Hæm. luctuosus*, Cuv., and a third in the antarctic hemisphere, which is entirely black, the (*Hæm. niger*, Cuv.,) *Hæm. ater*, Vieill. Gal. 230; Quoy and Gaymard, Voy. de Freycinet, pl. xxxiv.

It is impossible to avoid placing near the Plovers and Oyster-catchers, the

Cursorius, Lac.—Tachydromus, Illig.

Whose beak, more slender, but equally conical, is arcuated, has no groove, and is moderately cleft; the wings are shorter, and their legs, which are longer, are terminated by three toes without membranes, and without a thumb.

There has been seen both in France and England, although very rarely, a species, belonging to the north of Africa, of a light fawn-colour, with a whitish belly, the *Charadrius gallicus*, Gm.; *Cursorius isabellinus*, Meyer, Enl. 795; and another has been brought from India of a brownish-grey, with a red breast, the *Ch. coromandelicus*, *Curs. asiaticus*, Lath., Vieill. Gal. 232,

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form, and even the distribution of their colours, resemble those of the Lapwings and Plovers, and there can be no possible reason for placing them among the Jacanas, whose characters differ on almost every point.

Add *Tr. macroptera*, a new species from Java; grey; head and belly black; armed, and with caruncles; the wings extending considerably beyond the tail.

Enl. 892. Each of them has a black streak and a white one behind the eye. Their name is derived from the swiftness with which they run. Nothing is known with respect to their habits.(1)

As far as we can judge from their exterior, it is here that we can most conveniently place the

Cariama, Briss.—Microdactylus, Geoff.—Dicholophus, Illig.(2)

Whose beak is longer and more hooked, the commissure extending under the eye, which gives them somewhat of the physiognomy and disposition of birds of prey, and approximates them somewhat to the Herons. Their extremely long and scutellated legs are terminated by very short toes, slightly palmated at base, and by a thumb which cannot reach the ground.

One species only is known, and that is from South America, the *Micro. cristatus*, Geoff.; *Palamedea cristata*, Gm.; *Saria*, Azzar.; Ann. du Mus. d'Hist. Nat., XIII, pl. xxvi; Col. 237, and Vieill. Gal. 259. It is larger than the Heron, and feeds on lizards and insects, which it hunts for on high grounds and along the edges of forests. Its plumage is a fawn-coloured grey, waved with brown; some slender feathers on the base of the beak form a light tuft which inclines forwards. It flies but seldom, and then badly; its loud voice resembles that of a young Turkey. As its flesh is much esteemed, it has been domesticated in several places.

FAMILY III.

CULTRIROSTRES.

This family is recognized by the thick, long, and strong beak, which is most generally trenchant and pointed, and is almost wholly composed of the birds comprised in the genus Ardea of Linnæus. In a great number of species, the trachea

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(1) Add the *Coure-vite à ailes violettes* (*Curs. Chalcopterus*, T.), Col. 298;—the *C. à double collier* (*C. bicinctus*, T.), Man. Orn.;—*Curs. Temminckii*, Swains. Zool. Ill. 106.

(2) *Microdactylus*, short-finger. *Dicholophus*, crest in two rows. *Hæmatopus*, blood-coloured feet. M. Vieillot has preferred the barbarous name of *Cariama*, which must be pronounced *çariama*.

of the male forms various curves; their cæca are short, and even the true Herons have but one.

We subdivide it into three tribes, the Cranes, the true Herons, and the Swans. The first tribe forms but one great genus.

Grus, Lin.

The Cranes have a straight beak, but slightly cleft; the membranous fossæ of the nostrils, which are large and concave, occupy nearly one half of its length. Their legs are scutellated, and the toes moderate; the external ones but slightly palmate, and the thumb hardly reaching to the ground. A more or less considerable portion of the head and neck is destitute of feathers in nearly all of them. Their habits are more terrestrial, and their food more vegetable than those of the following genera: consequently they have a muscular gizzard, and long cæca. Their lower larynx has but one muscle on each side. At the head of this genus we place with Pallas,(1)

Psophia, Lin.,

Or the Trumpeters, which have a shorter beak than the other species; the head and neck are merely invested with down, and the circumference of the eye is naked. They live in the woods, and feed on grain and fruit.

The species best known is from South America, and is called the *Trumpeter*, (*Psophia crepitans*, L.,) Enl. 169, from its faculty of producing a low, deep sound, which at first seems to proceed from the anus. It is the size of a capon; the plumage is blackish, which, on the breast, reflects a brilliant violet hue; the mantle is ash coloured, shaded above with fawn colour. It is a very grateful bird, and as susceptible of attachment to man as a dog. It is even said to be so docile as to take the command of the poultry-yard. It flies badly, but runs fast, and builds on the ground at the foot of a tree. Its flesh is eaten.(2)

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(1) Spicil. Zool., IV, 3.

(2) At Cayenne, according to Barrere, it is called *Agami; Caracara* in the Antilles, according to Dutertre. As the name of *Trumpeter* is also given in Africa to a *Calao*, Fermin (Descrip. de Surin.) absurdly transfers to the Agami the character of both beaks at once. The *Agami* was for a long while confounded with the *Macucagua* of Marcgrave, which is a *Tinamou*. *Psophia* is a name coined by Barrere from Ψοφεω, to make a noise.

Add, *Psophia viridis*, Spix, 83, and *Ps. leucoptera*, Id. 84.

Certain Cranes, foreign to Europe, with a shorter beak than is found in those that belong to it, should come next.

Ardea pavonia, L.; *Grue couronné;* Enl. 265, and the young, Vieill. 257. (The Crowned Crane.) Figure, light and graceful; four feet in height; ash coloured, black belly, fawn coloured rump, and white wings; its naked cheeks are tinged with white, and a bright rose-colour, and its head is crowned with a bundle of yellow, slender feathers, which it opens and displays at pleasure. This beautiful bird, whose voice resembles the clang of a trumpet, inhabits the western coast of Africa, where it is frequently kept in the huts, and fed on grain. In a wild state it frequents inundated places, and preys on small fish.

Ardea virgo; Demoiselle de Numidie; Enl. 246. (The Numidian Crane.) Similar to the preceding in form, and almost in size; ash coloured; a black neck with two beautiful whitish aigrettes, formed by the prolongation of the slender feathers which cover the ears. Those which have been observed in a state of captivity were remarkable for their fantastic and affected gestures.(1)

The Common Cranes have a beak as long as the head, or longer.

Ardea grus, L.; *Grus cinerea*, Bechst., Enl. 769; Frisch, 194; Naum. Ed. I, 2, f. 2. (The Common Crane.) Four feet and upwards in height; ash coloured; black throat; top of the head, red and naked; the rump ornamented with long, recurved and frizzled feathers, partly black. This bird has been celebrated from the earliest ages for its regular migrations from north to south in the autumn, and vice versa in the spring, which it effects in immense and well ordered bodies. It feeds on grain, but prefers the worms and insects of marshy grounds. This species is often mentioned by the ancient writers, because the course of its migrations seems to be through Greece and Asia Minor.(2)

Between the Cranes and Herons we must place

Ard. scolopacea, Gm.; *Le Courlan*, Enl. 848,(3) whose beak,

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(1) The anatomists of the Institute had applied to this bird, on account of its gestures, the names of *Scops*, *Otus*, and *Asio*, by which the ancients designated the *Ducs* of Europe (Bubo). Buffon, who had so well refuted this error as regarded the *Ducs*, falls into it himself when speaking of the *Ard. virgo*.

(2) To this genus also belong *Ard. canadensis*, Edw. 133; the *Grue à collier*, Enl. 865, and the *Crane of India*, Edw. 45, (*Ard. antigone*) Vieill., Gal. 256;—the *Grue blunche*, Enl. 889, (*Ard. americana*) and the *Ard. gigantea*, Pall., It., II, No. 30, t. I, which does not appear to us to differ in the least from the white one;—finally, the *Ard. carunculata*, which is not a Heron, as supposed by Gmelin.

(3) Vieillot has made his genus Aramus, Gal. p. 252, from this bird; Spix, pl. 91, calls it *Rallus ardeoïdes*.

thinner and more cleft than that of the Cranes, is inflated near the last third of its length, and whose toes, all tolerably long, are without any intervening membrane whatever. It has the habits, and is the size of a Heron; the plumage is brown, with two white pencils on the neck.

Ard. helias, L.; *Le Caurale* (Eurypyga, Illig.);(1) *Oiseau du soleil*, &c. Enl. 702. (The Sun-Bird.) The commissure of its bill, which is more slender than that of the Cranes, but furnished with similar nasal fossæ, extends to beneath the eyes, like that of the Herons, but the beak itself is destitute of the naked skin at its base. It is about the size of a Partridge, and its long slender neck, broad and open tail, and rather short legs give it a very different appearance from that of any other Wader. Its plumage shaded in bands and lines with brown, fawn-colour, red, grey and black, recalls to our minds the colouring of the most beautiful of the nocturnal Lepidoptera. It is found on the banks of the rivers in Guiana.

The second tribe is more carnivorous, and is known by its stronger beak and larger toes: we may place at its head,

Cancroma, Lin.

The Boat-bills, which would closely approach the Herons in the strength of their beak and in the regimen resulting therefrom, but for the extraordinary form of that organ, which we shall find, however, by close examination, to be nothing more than the beak of a Heron or Bittern, very much flattened. In fact, it is very wide from right to left, and is formed like two spoons, the concave sides of which are placed in contact. The mandibles are strong and trenchant, the upper one having a sharp tooth on each side of its point; the nostrils, situated near its base, are continued on in two parallel grooves to near the point. There are four toes to the feet, long, and almost without membranes, and accordingly we find that these birds perch upon trees on the banks of rivers, whence they precipitate themselves upon the fish, which constitute their customary food. Their gait is slow, and in their attitudes, they resemble the Herons. The species known is,

Cancr. cochlearia, L.; Enl. 38 and 369; Vieill. Gal. pl. 249. (The Boat-bill.) Size of a hen; whitish; grey or brown back; red belly; a white forehead, followed by a black calotte, which,

(1) Vieillot has changed this name into that of *Helias*.

in the adult male, is changed into a long tuft: inhabits the hot and marshy parts of South America.

Then comes,

Ardea, Cuv.

Or the Herons, the cleft of whose beak extends to beneath the eyes, a small nasal fossa continuing on in a groove close to its point. They are also distinguished by the internal edge of the nail of the middle toe, which is trenchant and denticulated. Their legs are scutellated; the thumb and toes tolerably long, the external web considerable, and the eyes placed in a naked skin which extends to the beak. Their stomach is a very large, but slightly muscular sac, and they have but one very small cæcum. They are melancholy birds, which build and perch on the banks of rivers, where they destroy great numbers of fish. There are many species in both continents, which can only be divided by a reference to some details of plumage.

The true Herons have a very slender neck, ornamented below with long pendent feathers.

Ard. major, and *Ard. cinerea*, L.; Enl. 755 and 787; Frisch, 198, 199; Naum. Ed. I, 25, f. 33, 34. (The Common Heron.) Bluish ash colour; a black tuft on the occiput; fore-part of the neck white, sprinkled with black tears; a large bird, whose depredations on the fish, in the rivers of Europe, render it highly prejudicial. It was formerly much celebrated for the sport it afforded to falconers.

Ard. purpurea, Enl. 788; Naum. Ed. I, Supp. 45, f. 89, 90.(1) (The Purple Heron.) Grey and red, or purple; belongs also to Europe.

The name of Crabeaters, (*Crabiers*,) has been applied to the smallest Herons, with shorter feet. The species most common in France, and found in its mountain districts, is,

Ard. minuta and *danubialis*, Gm.; *Le Blongios;* Enl. 323; Frisch, 207; Naum. Ed. I, 28, f. 37. Fawn coloured; calotte, back, and quills black. It is hardly larger than a Rallus, and frequents the vicinity of ponds.

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(1) The *Ard. purpurea, purpurata, rufa*, Gm., and the *africana*, Lath., according to Meyer, are mere varieties of the purple Heron.

Add *A. herodias*, Gm.; Wils. VIII, lxv, 2, the young of which is, perhaps, Enl. 858;—*A. cocoi*, Lath.; Spix, XC, under the false name of *Ard. maquari;*—*A. sibilatrix*, T. Col. 271;—*A. ludoviciana*, Gm. Enl. 909, from which the *A. virescens* does not specifically differ;—*A. Novæ-Guinæ*, Lath. Enl. 926, approaches somewhat to the *A. scolopacea*, Gm. in the beak.

The Onores, to the form of the Crabeaters, add the size of the true Heron, and the colour of the Bitterns.(1)

The Egrets are Herons whose feathers, on the lower part of the back, at a certain period become long and attenuated.

The most beautiful species, whose feathers are employed for the purpose which the name of these birds indicates, are:

Ard. garzetta; Enl. 901. (The Little Egret.) But half the size of the Heron. It is all white, and its slender feathers do not extend beyond the tail.

Ard. alba; Enl. 886. (The Great Egret.) This one is also entirely white, but larger. Both these species are found in Europe, where a third inhabits, whose tarsi are shorter, and whose attenuated feathers extend considerably beyond the tail; it is the *A. egretta*, Enl. 925.(2)

We have also thought it proper to approximate to the Egrets the *Ard. comata*, Gm.; Enl. 348; Naum. Ed. I, 22, f. 45. (The Crabeater of Mahon.) A bird of southern Europe, with a reddish-brown back, and white belly and tail. The adult has a yellowish neck, and a long tuft on the occiput.(3)

The feathers on the neck of the Bitterns are loose and separated, which increases its apparent size. They are usually spotted or striped.

A. stellaris, Enl. 789; Frisch, 205; Naum. Ed. I, 27, f. 36. (The European Bittern.) A golden fawn-colour, spotted and dotted with black; beak and feet greenish; is found among the reeds, whence it sends forth that terrific voice which has entitled it to the name of *Bos taurus*. Its attitude, when at rest, is singular; the beak being raised towards the heavens.(4)

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(1) *A. lineata*, Gm. Enl. 860;—*A. tigrina*, Id. Enl. 790, which appears to be the young of *A. flava*, Gm.

(2) Temminck thinks that the *A. alba* is the young of the *A. egretta*, and that the pl. Enl. 901 does not represent the Little Egret of Europe, but that of America.

(3) From the exact observations of Meyer, the *A. castanea*, Gm. or the *rallöides*, Scopol.;—*A. squaiotta;*—*A. Marsiglii;*—*A. pumila*, and even *A. erythropus*, and *A. malaccensis*, Gm. Enl. 911, are all mere varieties, or different ages of the Crabeater of Mahon, or *A. comata*. The *A. senegalensis*, Enl. 315, is also a young age of the same bird. It is perhaps the true Crane of the Balearic Islands of Pliny, XI, 37.

Add, *A. candidissima*, Wils. LXIII, 4;—the *Garde-boeuf*, *A. bubulcus*, Savign. Eg. Ois., pl. viii;—*A. leucocephala*, Gm. Enl. 910;—*A. jugularis*, Forster, or *gularis*, Bosc., Act. de la Soc. d'Hist. Nat. fol. pl. ii, or *albicollis*, Vieill. Galer. 253;—*A. cærulea*, Enl. 349, of which the *A. æquinoctialis*, Catesb. may probably be the young, notwithstanding the difference of colour;—*A. rufescens*, Gm. Enl. 902;—*A. leucogaster*, Enl. 350;—*A. agami*, Enl. 859. [Add *A. Pealii*, Bonap. and *R. ludoviciana*, Wils. VIII, pl. lxiv, f. 1. *Am. Ed.*]

(4) Add *A. minor*, Wils. VIII, lxv, 3, or *A. stellaris*, B. Gm.; Edw., 136;—*A.*

The adult Night-Heron, with the port of the Bitterns, and a beak proportionably thicker, has a few slender feathers on the occiput.

There is but one species found in France,

Ard. nycticorax, L.; *Bihoreau d'Europe*,(1) Enl. 758; Frisch, 203; Naum, Ed. I, 26, f. 35. (The Night Heron.) The male is white; back and calotte black; the young bird, Enl. 759, grey with a brown mantle and a blackish calotte.(2)

We must observe, however, that these various subdivisions of the Herons are of but little importance, and are by no means well marked.

The third tribe, besides having a thicker and smoother beak than is found in the second, has tolerably strong and almost equal membranes between the base of the toes.

Ciconia, Cuv.

The Storks have a thick beak, moderately cleft; no fossæ or grooves; the nostrils pierced towards the back and near the base; an extremely short tongue. Their legs are reticulated, and the anterior toes strongly palmated at base, particularly the external ones. The light and broad mandibles of their beak, by striking against each other, produce a clash which is almost the only sound that proceeds from these birds. Their gizzard is but slightly muscular, and their cæca so small that they are scarcely perceptible. Their lower larynx has no peculiar muscle; their bronchiæ are longer than common, and composed of more than the usual number of rings. There are two species in France,

Ardea ciconia, L.; Enl. 886; Frisch, 196; Naum. Ed. I, 22, f. 31. (The White Stork.) White; quills of the wings black; feet and beak red. A large bird, held in great veneration by the people, a distinction arising from the fact that it destroys snakes and other noxious reptiles. It prefers building its nest on towers, in steeples, &c.; and after having once constructed

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undulata, Gm. Enl. 768;—*A. philippensis*, Gm. Enl. 908. [Add, also, *A. violacea*, Wils. VIII, pl. lxv, f. 1;—*A. cærulea*, Wils. VII, pl. lxii, f. 3;—*A. virescens*, Wils. VII, lxi, f. 1;—*A. exilis*, Wils. VIII, pl. lxv, f. 4. *Am. Ed.*]

(1) According to Meyer, the results of whose labours we still follow, the *Ard. grisea*, *A. maculata*, and the *A. badia* of Gmel. are different states of the *A. nycticorax*.

(2) Add *A. pileata*, Lath., or *A. alba*, β; Gm., Enl. 907;—*A. caledonica*, Lath.;—*A. cayennensis*, Enl. 899, or *violacea*, Wils. VIII, lxv, 1, of which *A. jamaïcensis*, Gm. is the young;—*A. sibilatrix*, T. Col. 271.—The *Pouacre*, Buff. (*Ard. Gardeni*, Gm.) Enl. 309, appears to be the young of an ash coloured Night Heron, with a bronze-black calotte and back. It is the same as the *A. maculata*, Frisch, 202.

it, returns to the same spot in the spring, passing the winter in Africa.

Ard. nigra, L.; Enl. 399; and the young, Frisch, 197; Naum. 23, f. 32. (The Black Stork.) Blackish, with purple reflections; belly, white. Haunts solitary marshes, and builds in forests.(1)

Among various species we may distinguish,

The Bare-necked Storks,

Which have a thicker beak than the others, but one composed of a light substance; and among them

The Pouched Storks, *Ard. dubia*, Gm.—*Ard. algala*, Lat.

Which have an appendage under the middle of the throat, resembling a thick sausage, and from under whose wings are procured the feathers forming those light plumes called by the French, *Marabous*. They are the largest birds of the genus; their belly is white, and their mantle a bronze-black. There are two species,

Cic. marabou, Tem., Col. 300, from Senegal, with a uniform mantle, and *Cic. argala*, Tem., Col. 301, from India, whose wing-coverts are edged with white. By means of their broad bill, they are enabled to capture birds on the wing.(2)

Mycteria, Lin.

The Jabirus, separated from Ardea by Linnæus, are closely allied to the Storks, and much more so than the latter are to the true Herons; the moderate opening of their beak, the nostrils, the reticulated envelope of the tarsi, and the extent of the membranes between the toes are the same as in the Storks; their mode of life is also similar. Their peculiar character consists in a beak slightly curved upwards near the extremity.

Myct. americana, L.;(3) Enl. 817 (The American Jabiru),

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(1) To this genus also belongs the *Maguari*, or American Stork, (*A. maguari*) Vieill. Galer. 254; and Spix, LXXXIX, under the wrong name of *Ciconia jubura*, which, with the exception of its ash coloured beak, differs but little from our White Stork;—the little *C. noire de Nubie* (*Cic. Abdimii*, Lichtenst.) Ruppel. 8;—the *C. violette* (*C. leucocephala*, Gm.) Enl. 906.

(2) Add the *Cigogne chevelue* (*C. capillata*, T.), Col. 312.

(3) *Touyouyou* in Cayenne; *Aïaïai* in Paraguay, *Collier rouge*, &c. Barrere has confounded it with the *American Ostrich*, which has caused the name of *Touyouyou*, or *Touyou*, to be transferred to that bird by Brisson and by Buffon.

Mycteria, a name derived by Linnæus from μυκτηρ, nose, proboscis, on account of its large beak.

is the most known species. It is very large; white; head and neck naked, and invested with a black skin, the lower part of which is red; a few white feathers on the occiput only; beak and feet black. Found along the borders of ponds and marshes in South America, where it preys upon reptiles and fish.(1)

Scopus, Briss.(2)

The Umbres are only distinguished from the Storks by a compressed beak, whose trenchant ridge is inflated near the base, and whose nostrils are continued by a groove, which runs parallel with the ridge to its end, the latter being slightly hooked. Only one species is known,

Scop. umbretta, Enl. 796; Vieill. Galer. 250 (The Umbre), which is the size of a Crow, and of an umber colour. The occiput of the male is tufted. Found throughout Africa.

Hians, Lacep.—Anastomus, Illig.

These birds are only separable from the Storks by a character of about equal consequence with that of the Jabiru. Their two mandibles only come in contact at the base and point, leaving an interval between the middle of their edges. Even this seems to be the result of detrition, for the fibres of the horny substance of the beak, which appear to have been worn away, are very visible.

They are from the East Indies. One is whitish, *Ardea ponticeriana*, Gm., Enl. 932; and Vieill. Gal. 251, and the other a brown-grey,—*Ardelia coromandeliana*, Sonner. It., II, 219. The quills of the wings and tail are black in both. Perhaps the last one may be the young of the first. A third, of an irised-black, *Bec-ouvert à lames; An. lamelliger*, Tem. Col. 236, is remarkable because the stem of each of its feathers terminates in a narrow horny plate, which extends beyond the barbs. The

Dromas, Paykull,

Strongly resembles the preceding birds, having the same feet and carriage, but its compressed beak, the under part of which is somewhat inflated at base, is perforated by oval nostrils, and its edges join closely.

Dromas ardeola, Payk., Stockh. Mem., 1805; pl. 8; Col. 362. The only species known. Its plumage is white; part of the

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(1) Add, *Myc. senegalensis*, Lath., Vaill. Gal. 255, from which the *Ciconia ephippirhyncha*, Rupp. Av. 3, only differs in being drawn from the recent specimen, and showing two tufts or bobs at the base of the beak.

(2) *Scopus*, from Σκοπος, sentinel.

mantle and wings black. From the shores of the Red Sea, and of the Senegal river.(1)

Tantalus, Lin.

The Wood-Pelicans have the feet, nostrils and beak of the Stork; but the back of the beak is rounded, its point curved downwards, and slightly emarginated on each side: a part of their head and sometimes of the neck, is destitute of feathers.

T. loculator, L.; Enl. 868; Wils. VIII, lxvi, 1. (The Wood-Pelican of America.) Is the size of a Stork, but more slender; white; quills of the wings and tail, black; beak and feet, as well as the naked skin of the head and neck, blackish. It inhabits both Americas, arriving in each country about the rainy season, and frequenting muddy waters, where it chiefly hunts for eels. It is a stupid bird, whose gait is very slow.

T. ibis, L. Enl. 339. (The Wood-Pelican of Africa.) White, lightly shaded with purple on the wings; beak yellow; skin of the face red and naked. This is the bird which has long been considered by naturalists as the *Ibis* of the ancient Egyptians, but recent researches have proved that the Ibis is a much smaller bird, of which we shall speak hereafter. The Tantalus is not even usually found in Egypt; the specimens we possess are brought from Senegal.

T. leucocephalus; Tantale de Ceylan, Encyc. Method. Orn. pl. 66, fig. 1; Vieill. Gal. 247 (The Wood-Pelican of Ceylon), is the largest of all, and has the stoutest beak. This beak and the skin of the face are yellow; plumage white, with black quills; a black cincture round the breast; long rose-coloured feathers on the rump, which are shed during the rainy season.(2)

Platalea, Lin.(3)

The Spoonbills approximate to the Storks in the whole of their structure; but their bill, whence they derive their name, is long, flat, broad throughout, becoming widened and flattened, particularly at the end, so as to form a spatula-like disk; two shallow grooves, originating at its base, extend almost to the end, but without being

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(1) Dupont, Ann. des Sc. Nat. tom. IX, pl. xlv. It is the *Erodia amphilensis*, Salt., Voy. in Abyss., Atl. pl. xxxi.

(2) Add the *T. lacteus*, T. Col. 352.

(3) *Platalea*, or *Platea*, Latin names, sometimes used as synonymous with *Pelicanus*.

parallel to its edges. The nostrils are oval, and situated at a short distance from the origin of each groove. Their small tongue, reticulated legs, the extent of the membranes of their feet, their two very small cæca, their but slightly muscular gizzard, and their lower larynx destitute of peculiar muscles, are the same as in the Storks, but the expansion of their bill deprives it of all its strength, and renders it fit for nothing but turning up mud, or capturing small fish or aquatic insects.

P. leucorodia, Gm.; Enl. 405; Naum. Supp. 44, f. 87. (The White Spoonbill.) All white, and a crest on the occiput; it is found throughout the eastern continent, where it builds on high trees. The "*Spatule blanche sans huppe*," Buff. Hist. des Ois. tom. VII, pl. 24, according to Bail, is but the young of this species. Besides the absence of the crest, it is distinguished by the quills of the wings having a black edge.

P. aiaia; La Spatule rose; Enl. 165; Vieill. Gal. 248. (The Roseate Spoonbill.) The face is naked, and the plumage tinged with various shades of a bright rose-colour which becomes more intense with age. It is peculiar to South America.

FAMILY IV.

LONGIROSTRES.

This family is composed of a multitude of Waders, most of which were included in the genus *Scolopax* of Linnæus, and the remainder confounded in that of *Tringa*, L., though partly in opposition to the character of this genus, which consists in a thumb too short to reach the ground. A small number were placed among the Plovers on account of the total absence of a thumb. All these birds have nearly the same form, similar habits and very frequently even a similarity in the distribution of their colours, which renders it a difficult matter to distinguish one from another. Their general character is a long, slender, and feeble bill, the use of which is restricted to searching in the mud for worms and insects; the different gradations in the form of this bill serve to divide them into genera and subgenera.

According to his own principles, Linnæus should have united most of these birds in the great genus

Scolopax, Lin.

Which we divide as follows, according to the variation in the form of the bill.(1) The

Ibis, Cuv.

Separated by us from the *Tantalus* of Gmelin, because the bill, though arcuated like that of Tantalus, is much more feeble, and has no emargination near its point; the nostrils also, perforated near the back of its base, are severally prolonged in a groove which extends to the end. Besides, this bill is tolerably thick and almost square at base, and some part of the head or even of the neck is always destitute of feathers. The external toes are considerably palmated at base, and the thumb is sufficiently large to bear upon the ground.

Some of them have short and reticulated legs; they are usually the stoutest, and have the largest beak.

Ibis religiosa, Cuv.; *Abou-Hannes*, Bruce, It., pl. 35; *Tantalus æthiopicus*, Lath.; the adult, Cuv., Oss. Foss. tom. I, and the young, Savign. Descript. de l'Egypte, Hist. Nat. des Ois., pl. 7 (The Sacred Ibis), is the most celebrated species. It was reared in the temples of ancient Egypt, with a degree of respect bordering on adoration; and, when dead, it was embalmed. This, according to some, arose from its devouring serpents, which otherwise might have infested the country; others again are of opinion that it took its origin from some relation between its plumage and one of the phases of the moon; while a third class of authors attribute it to the fact that its appearance announced ed the overflow of the Nile.(2) The Tantalus of Africa was for a long time considered as the Ibis of the Egyptians; it is now known to be a bird of the present genus, as large as a Hen, with white plumage, the tips of the wing-quills excepted, which are black; the barbs of the last coverts are slender, and of a black colour, with violet reflections, and cover the tips of the wings and the tail. The bill and feet, as well as the naked part of the head and neck, are black: this part, at an early age, is covered with small blackish feathers, or, at all events, its upper surface is thus furnished. Found throughout Africa.(3)

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(1) This is another of these distinctions and names borrowed by Vieill. (Gal. 246) without any acknowledgement, although my memoir upon the Ibis, in which I establish it, is dated fifteen years prior to any of his writings upon birds.

(2) Savigny, Mem. sur l'Ibis.

(3) There is a neighbouring species in the Moluccas which has a longer beak,

Others have scutellated legs; their beak, most commonly, is more slender.

Ib. rubra; Scol. rubra, L.; *Tantal. ruber*, Gm.; Enl. 80 and 81; Wils, VIII, lxvi, 2. (The Red Ibis.) A bird found in all the hot parts of America, remarkable for its bright red colour; the tips of the wing-quills are black. The young ones, at first covered with a blackish down, become cinereous, and, when ready to fly, whitish; in two years the red makes its appearance, and continues to increase in lustre with age. This species does not migrate, and lives in flocks in marshy spots in the vicinity of estuaries. It is easily domesticated.

Scol. falcinellus, L.; *Courlis vert*, Enl. 819; Naum. Ed. I, Supp. 28, Savig. Eg. Ois. pl. vii, f. 9. (The Green Ibis.) A purple brown-red; mantle of a deep green; the head and neck of the young marked with whitish dots. It is a beautiful bird of southern Europe, and of northern Africa, and most probably the species denominated by the ancients the *Black Ibis*.(1)

Numenius, Cuv.(2)

The Curlews have the beak arcuated like that of the Ibis, but it is more slender, and round throughout: the tip of the upper mandible extends beyond the end of the lower one, and projects a little downwards in front of it. The toes are palmated at base.

Scol. arcuata, L., Enl. 818; Frisch, 224; Naum. 5, f. 5. (The Curlew of Europe.) Is the size of a Capon; brown; the edges of all the feathers, whitish; rump, white; tail, striped with white and brown. Common along the coast of Europe, and in transitu in the interior. Its name is derived from its cry.(3)

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the coverts less slender, and partly varied with white; long and pointed feathers on the upper part of the breast, (*Ibis molucca*, Cuv.) and another in Bengal, with but slightly attenuated ash coloured coverts (*Ibis bengala*, Cuv.).

Add *Ib. papillosa*, T. Col. 304;—*Tant. calvus*, Gm., Enl. 867;—*Ibis nudifrons*, Spix, 86;—*Ib. oxycercus*, Id. 87;—*T. albicollis*, Gm. or *Curicaca* of Marcgr., Enl. 976;—*Tant. cayennensis*, Gm., Enl. 820;—*Ibis plumbeus*, T. Col. 235;—*Tant. melanopis*, Gm.; Lath., III, pl. lxxix;—*Ib. chalcoptera*, Vieill. Gal. 246, or *Tant. hogedash*, Lath.

(1) Add *Tantalus albus* and *T. coco*, Gm.; Enl. 195;—*T. cristatus*, Id.; Enl. 841;—*Ibis leucopygus*, Spix, 88, if it should not prove to be the young of the *ruber*;—*Tant. leucocephalus*, Lath., III, pl. lxxx, 2. [N.B. The *T. fuscus* of Gm. is the young of the *T. albus*, Id. *Am. Ed.*]

(2) *Numenius*, derived from *néoménie*, new moon, on account of its crescent shaped beak.

(3) Add the *Courlis à mèches étroites* of the Cape (*Num. virgatus*, C.), Enl. 198;—the *C. à m. èt.* of India (*N. lineatus*);—the *Num. longirostris*, Wils. of America, Am. Orn. II, xxiv, 4;—*Num. hudsonius*, Id. LXVI, f. 1.

Scol. Phœopus, L.; *Petit Courlis;* Enl. 142; Edw. 307; Frisch, 225; Naum. 10, f. 10.(1) Half the size of the preceding, but has nearly the same plumage.(2)

SCOLOPAX, Cuv.(3)

The Snipes have a straight beak, the nasal furrows extending to near its point which is a little inflated externally to reach beyond the lower mandible, and on the middle of which there is a simple groove; this point is soft and very sensible, and when dried, after death, assumes a punctured appearance. Their feet are not palmated. A peculiar character of these birds consists in their compressed head and large eyes placed very far back, which gives them a singularly stupid air, an indication which is confirmed by their habits.

Scol. rusticola, L.; *La Bécasse;* Enl. 885; Frisch, 126, 227; Naum. Ed. I, I, f. 1. (The Woodcock.) The well known plumage of this bird is variegated above with grey, red and black spots and bands; grey beneath, with transverse blackish lines. Its distinguishing character consists of four broad, transverse, black bands, which succeed each other on the back part of the head. During the summer it inhabits lofty mountains, and descends into the woods in the month of October. It lives either singly or in pairs, particularly in bad weather, and feeds on worms and insects. Few of them remain on the plains during summer.(4)

Scol. gallinago, L.; *La Bécassine*, Enl. 883; Frisch, 229; Naum. 3, f. 3. (The Snipe.) Smaller than the preceding, and with a longer beak; is distinguished by two broad, longitudinal black bands on the head, by the neck spotted with brown and fawn colour, by a blackish mantle with two longitudinal fawn

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(1) *Phœopus* (ash-coloured foot), a name composed by Gesner.

(2) Add the *Num. tenuirostris*, Ch. Bonap.;—the *Num. rufus*, Vieill. Gal. 245;—the *Courlis demi-bec* (*Num. brevirostris*, T.), Col. 381.

N.B. In this genus, and almost in the whole of this family, the beak becomes lengthened by age.

(3) Scolopax, the Greek name of the Woodcock, from σκολοψ, stake, on account of its straight and pointed beak. Vieillot has changed it into RUSTICOLA.

(4) Add a closely allied species of North America (*Scol. minor*, Gm.), Arct. Zool. II, pl. xix; Vieill. Gal. 242; Wils., VI, xlviii, 2;—*Scol. sabini*, Vig., Lin. Trans. XIV, pl. xxi, if a true species.

(5) Add the *Bécassine muette* of Eur., *Scol. Brehmii*, Kaup., Isis., 1823;—*Scol. paludosa*, Gm. Enl. 895, which is the *Sc. gallinago*, Wils. VI, xlvii, 1;—*Scol. gigantea*, Tem. Col. 403.

The *Brunette* of Buffon, *Scol. pusilla*, *Dunlin* of the English, is only the *Tringa alpina*, Gm.

coloured bands, by its brown wings watered with grey, by a whitish belly, the flanks watered with brown, &c. It frequents marshes, edges of rivulets, &c. and ascends out of sight, pouring out its piercing note from a great distance, which sounds like the bleating of a goat. It is found in nearly the same state in all parts of the globe.

Scol. major, Gm.; *La double Bécassine;* Frisch, 228; Naum. 2, f. 2. (The Great Snipe.) Is distinguished from the preceding by being a third larger, and by the grey or fawn coloured undulations above being smaller, and the brown ones beneath larger and more numerous.

Scol. gallinula, Gm.; *La Sourde;* Enl. 884; Frisch, 231; Naum. 4, f. 4. (The Jack Snipe.) Nearly one half smaller than the *Scol. gallinago;* has but one black band on the head; the ground of the mantle reflects a bronze-green; a grey demi-collar on the neck; the flanks spotted like the breast with brown; it remains nearly the whole year in the marshes of Europe. We should distinguish from all others, the

Sc. grisea, Gm.; Wils. VII, lviii, 1; *Sc. Paykullii*, Nils. Orn. Suec. II, pl. 2, and in summer plumage, *Scol. Noveboracensis*, Lath. (The Red-breasted Snipe.) Which differs in the external toes being semi-palmated. It is more ash-coloured in winter, and more reddish in summer, the rump always white, spotted with black. It is also seen in Europe.(1)

Rhynchæa, Cuv.(2)

Birds of India and Africa, whose nearly equal mandibles are slightly arcuated at the end, and in which the nasal fossæ extend to the tip of the upper one, which has no third groove. Their feet are not palmated. To the port of Snipes they add more lively colours, and are particularly remarkable for the ocellated spots which decorate the quills of both wings and tail.

These birds are found of various colours, and Gmelin, considering them as varieties, unites them under the name of *Scol. capensis*. M. Temminck also considers them as different ages of one bird.(3)

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(1) It appears that Vieillot restricts the name of *Scolopax* to this subdivision, that is, if, as I think, his pl. 241 represents this bird; it is not, however, exact. M. Leach makes his genus Macroramphus of it.

(2) Vieillot has adopted this name and genus, Gal. pl. 240.

(3) *Scol. capensis*, δ, Gm. Enl. 922, should be the adult; *Scol. capensis*, γ, Enl. 881, or *Rynchæa variegata*, Vieill., Galer. 240, the young, and Enl. 270, an intermediate age. The *Chevalier vert*, Briss. and Buff. (*Rallus benghalensis*, Gm.), Albin. III, 90, is also of this genus, and does not even appear to differ from the va-

Limosa, Bechst.(1)

The Godwits have a straight beak, longer than the Snipes, and sometimes even slightly arcuated near the top. The nasal groove extends close to the tip, which is blunt and somewhat depressed; no third groove or punctation on its surface. The external toes are palmated at base. Their form is more slender, and their legs longer than those of Snipes; they frequent salt marshes and the sea-shore.

Scol. leucophæa, Lath., and *laponica*, Gm.; *Barge aboycusc;* the young, Brit. Zool. pl. xiii; Briss. V, pl. xxiv, f. 2; the adult in summer plumage, Enl. 900.(2) (The Common Godwit.) In winter, a deep brown-grey, the feathers edged with white; the breast, a brown-grey; whitish above; rump, white striped with brown, &c. In summer it is red, with a brown back. The tail is always striped with white and black.

Scol. ægocephala and *belgica*, Gm.; *Limosa melanura*, Leisler; in winter plumage, Enl. 874; in that of summer, Ib. 916. (The Black-tailed Godwit.) In winter a cinereous grey, browner on the back; white belly; in summer, head, neck, and breast, red; the mantle, brown spotted with red; beneath, striped with brown, red and white bands; tail always black, edged with white at the tip. These two birds are double the size of the Woodcock, and their changes of plumage have occasioned various multiplications of the species. The last, during the summer, covers the plains of New Holland. Its cry is very shrill and resembles that of a Goat.(3)

Calidris, Cuv.—Tringa, Temm.(4)

The bill of the Sandpipers is depressed at the end, and the nasal

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riety represented, Enl. 922. N.B. This last plate is the only one that gives a correct representation of the beak peculiar to this little subgenus. Add, a very distinct species from Brazil, *Rhynchæa hilarea*, Val., Bullet. des Sc. de Ferussac, c. 2.

(1) Vieillot has changed this name into Limicula, Gal. 243.

(2) Gmelin has made the young of this bird a variety of the following species, and quotes the fig. of Brisson, by the name of *Scol. glottis*, which is a Ruff. The adult is his *Scol. laponica*. The *Limosa Meyeri*, Leisl. and Temm., is this species in its winter livery, and *Lim. rufa*, the same in its summer plumage.

(3) Add *Scol. fedoa*, L.; Wils. VII, pl. lvi, 4, or the *Limicula marmorata*, Vieill. Galer. 243. We might distinguish the *Scol. terek* or *Sc. cinerea*, Gm.; Guldenst., Nov. Act. Petrop., XIX, pl. xix, whose beak is curved upwards, and whose feet are semi-palmated. It leads to the *Recurvirostres*.

(4) *Calidris*, "an ash coloured and spotted bird, frequenting rivers and woods," Aristotle. Brisson has applied it to the Great Sandpiper.

fossæ are very long as in the Godwits, but this bill is not usually longer than the head; their slightly bordered toes have no membranes at base, and their thumb can hardly reach the ground; their moderately long legs and short figure give them a heavier carriage than that of the Godwits. They are also much smaller.

Tringa grisea, *Tr. cinerea*, and *Tr. canutus*, Gm.; *La Maubèche*, Enl. 366; Edw. 276; Wils. VII, lvii, 2. (The Sandpiper.) Winter plumage ash-coloured above, white beneath, with blackish spots on the front of the neck and breast. In its summer livery, *Tr. islandica*, Gm., or *Tr. rufa*, Wils. VII, lvii, 5, it is spotted above, fawn colour and blackish; underneath, red. The *Tr. nævia*, Enl. 365, is an intermediate state. The coverts of the tail are always white striped with black, and its quills grey. Nearly as large as a Snipe.

Tr. maritima, Brun.; *Tr. nigricans*, Montag., Lin. Trans. IV, pl. 11, f. 2; Brit. Zool. in fol., pl. c. 2, f. 1. Somewhat less than the preceding; grey; the mantle blackish; wings undulated with whitish; whitish belly. It is common on the coast of Holland, rare in France. Always settles on stones.(1)

Arenaria, Bechst.—Calidris, Vig.

The Sanderlings resemble the Sandpipers in every point but one, viz. they have no thumb, as is the case with the Plovers.

The species known, *Charadrius calidris*, Gm. Briss. V, pl. xx, § 2; Vieill. Gal. 234, is, in winter, greyish above; front and underneath white; blackish wings, varied with white; Wils., VII, lix, A. In summer, its back is spotted with fawn-colour and black, and its breast dotted with blackish,—*Char. rubidus*, Wils., VII, lxiii, 3.(2)

Pelidna, Cuv.

The Pelidnæ are merely small Sandpipers, with a bill somewhat longer than the head. The edging of their feet is insensible.

Tringa cinclus and *alpina; Alouette de mer* (The Sea-Lark), is a third smaller than the Great Sandpiper, and like it, in winter,

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(1) Add of European species: *Tr. Temminckii*, Leisler, Col. 41, 4;—*Tr. minuta*, Leisl. Naum. 21, f. 50. Of species foreign to that country: *Tr. leucoptera*, Gm., Lath. Syn. III, pl. lxxxii;—*Tr. albescens*, Tem. Col. 41, 1;—*Tr. maculosa*, Vieill. Dict.;—*Tr. pusilla*, Wils., pl. xxxvii, 4.

Add *Tr. islandica*, L., Wils. VIII, p. lvii, f. 2, 5. *Am. Ed.*

(2) It has been confounded with the *Alouette de mer*, in its winter plumage, otherwise the little Sandpiper, or *Tr. arenaria*. Brisson, in particular, gives the figure of the one, and the description of the other. The *Calidris tringoïdes*, Vieill. Gal. 234, seems to be a bad figure of this bird in its summer livery.

is ash-coloured above, white beneath, and the breast shaded with grey; in summer, its plumage is fawn-coloured above, spotted with black, small black spots front of the neck and breast, and a black patch under the belly. It is then the *Tr. alpina*, Gm., or *Tr. cinclus*, B. Enl. 852; Wils., VII, lvi, 2. The *Tr. cinclus*, L., Enl. 851, is an intermediate state.(1)

The Cocorli only differs from the Sea-larks by its beak being slightly arcuated.

The species known, *Scolopax subarcuata*, Gm.; *Numenius africanus*, Lath.; Naum. 21, f. 28 and 20; f. 27, is, in winter, blackish above, undulated with grey and whitish beneath; in summer the back is spotted with black and fawn-colour, the wings are grey, and the head and under part of the body red. It is found everywhere, though very rarely. The

Falcinellus(2)

Has a beak somewhat more arcuated than that of the Cocorli; the thumb, moreover, is deficient.

One species only is known, *Scol. pygmæa*, L., a native of Africa, but which has sometimes been seen in Europe.

Machetes, Cuv.(3)

The Ruffs are true Sandpipers in their bill and carriage; the membrane between their external toes, however, is nearly as extensive as in Totanus, Limosa, &c.

One species only is known, the *Tringa pugnax*, L., Enl. 305, 306. It is somewhat smaller than a snipe, and celebrated for the furious combats which take place among the males in the nuptial season. At this period the head is partly covered with red papillæ, the neck is surrounded with a thick collar of feathers, so variously arranged and coloured, and projecting in such fantastic positions, that no two individuals can be found alike; even before this epoch there is so much diversity in their plumage, that many imaginary species have been described by naturalists.(4) Their feet are always yellowish, which with

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(1) This is most probably the place for the *Tringa macroptera*, Spix, XCII. Add Am. Spec. *Tr. Schinzii*, Brehm.;—*Tr. pectoralis*, Bonap.;—*Tr. platyrhinca*, Temm. *Am. Ed.*

(2) Vieillot has changed this name into Erolia. It is not, as has been asserted, destitute of a thumb.

(3) Μαχητης, pugnator. Πελιδνος, fuscus.

(4) The *Chevalier varié*, Buff., Sp. IV; Briss. V, pl. xvii, 2 (*Tringa littorea*, L.; *Tringa ochropus*, B.; *littorea*, Gm.). The *Chevalier*, properly so called, Buff.

their beak and their semi-palmated external toes, furnish a mark which may assist us to recognize them. This bird, common to the whole north of Europe, is also found on the coast of France, particularly in the spring, but it does not build there.(1)

There are some small birds in America resembling the Sandpipers, whose feet are semi-palmated anteriorly; (the HEMIPALAMA, Bonap.) *Tringa semi-palmata*, Wils., VII, lxiii, 4; *Tringa brevirostris*, Spix, xciii.

It appears that it is near the Sandpipers we must place the

EURINORHYNCHUS, Wilson.

Which is distinguished from them by its depressed bill, widened at the end almost like that of the Spoonbill, the only known species of which,

Platalea pygmæa, L.; *Eurinorhynchus griseus*, Wils., Thunb., Acad., Suec., pl. VI, is one of the rarest in existence, for only a single individual has been found: it is grey above, white beneath, and hardly as large as a Pelidna.

PHALAROPUS, Briss.(2)

Small birds, whose bill, though flatter than that of the Sandpipers, is similarly proportioned, and has the same grooves; the toes also are bordered with wide membranes like those of Fulica. The species known,

Phal. fulicarius, Bonap.; *Tringa lobata* and *Tr. fulicaria*, L.(3) has a very large beak for a member of this family. In winter, it is ash-coloured above; beneath, and the head, whitish; a black band on the neck: it is then the *Tr. lobata*, Edw. 308. In summer it becomes black, streaked with fawn colour above, and reddish beneath: there is at all times a white band on the wing, which is blackish: it is then the *Phalaropus rufus*, Bechst. and

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Sp. II; Briss. V, pl. xvii, fig. 1, quoted by Gmel. under *Scol. calidris;* the true *Maubèche*, Briss. V, pl. xx, fig. 1 (*Tringa calidris*, Gm.): the bird of Frisch, pl. 238, are all ruffs in different states of plumage, many other varieties of which might still be represented.

According to Meyer, the *Tringa grenovicensis*, Lath. is also a young Ruff.

(1) A true *Ruff* was shot on Long Island a few weeks ago (May 1830). It is the only one ever found in this country. *Am. Ed.*

(2) Vieillot has changed this name into CRYMOPHILE, Gal., pl. 270.

(3) Meyer improperly confounds this bird, Edw. 308, with the *Tringa hyperborea* and the *Tringa fusca*, which have the beak of a Totanus, and of which we make our LOBIPES.

Meyer; *Tringa fulicaria*, L., Edw. 142;(1) *Crymophile roux*, Vieill., Gal., 270. This bird is rare in Europe.

Strepsilas.(2)

The Turn-stones stand rather low; the bill is short, and the toes are without membranes, like those of the true Sandpipers; but this bill is conical, pointed, without any depression, compression, or inflation, and the nasal fossæ do not extend to more than half its length. The thumb barely reaches the ground. Their bill, which is stronger and stiffer in proportion than that of the preceding birds, enables them to overturn stones, beneath which they find worms.

The mantle of one species is varied with black and red; head and belly, white; cheeks and breast, black; it is disseminated throughout both continents, and is the *Tringa interpres*, L., Enl. 856. There is also one varied with grey and brown, which is perhaps but the same species at a different age—Enl. 340 and 857; Vieill. Gal. 237.(3)

Totanus, Cuv.(4)

The beak of these birds is slender, round, pointed and solid; the nasal fossæ do not extend beyond the half of its length, and the upper mandible is slightly arcuated near the end. Their form is light and their legs long; but a small part of their thumb rests on the ground; their external web is well marked. Each of the species is found throughout almost the whole of the globe.

Scol. glottis, L.; *Chevalier aux pieds verts;* Albin. II, 69; Aldrov. Orn. III, 535; Brit. Zool. pl. c. 1? As large as a Limosa, beak thick and strong, a brown ash colour above and on the sides; edges of the feathers dotted with brown; white rump and belly; tail marked with narrow and irregular grey and white stripes; the feet green. In summer the neck and breast are spotted with brown; in winter the whole under part of the body is white. It is the largest of all the European species. *Scol. fusca*, L.; *Cheval noir; Barge brune;* Buff. Enl. 875; Frisch, 236,(5) has the graceful form of the Godwit, and in summer is a blackish brown above and slate-coloured beneath; the feathers

(1) Gmelin has increased the confusion by quoting this bird as a variety of the *hyperborea*.

(2) Vieillot has changed this name into that of Arenaria, Gal. pl. 237.

(3) See Edw., 141; Naum., Suppl. 62, f. 118; Wils. VII, lvii, 2. The *Chevalier varié*, Enl. 300, referred by Meyer to Strepsilas, is merely a Ruff.

(4) *Totano*, the Venetian name of a Limosa or Totanus.

(5) According to Meyer, the *Scol. curonica* and *cantabrigiensis*, and the *Tringa atra*, Gm. should be referred to this bird. The two first are the young ones.

bordered or dotted on the edge with whitish; the rump white, and the tail striped with brown and white, two characters which exist more or less in all the species of Europe; feet of a reddish brown. In winter the belly and breast become white, when it is almost ash coloured above, with red feet. It is then the *Grand Chevalier a pieds roges*, *Scol. calidris*, L. Enl. 876.(1)

Tringa gambetta, Gm. *Gambette;* Enl. 845; Frisch, 240, Naum. 9, f. 9. In summer, brown above, with black spots, and some few white ones, on the edges of the feathers; white beneath with brown spots, particularly on the breast and neck; red feet; numerous brown and white stripes on the tail. In winter its spots are nearly effaced, and the mantle is of an almost uniform grey; in this state it is the fig., Enl. 827. Its size is a third less.

Totanus stagnatilis, Bechst.; *Chevalier à longs pieds*, Bonelli. Something smaller than the preceding, but has longer and more slender legs: in summer its back is brown, with irregular black spots; its belly white, and brown spots mark the neck and breast. In winter the mantle becomes of a uniform grey, and the under part of the body white. The stripes on the tail are irregular and parallel to its edges.

Tringa ochropus, L.; *Le Bécasseau;* Enl. 843. A bronze-black above, the edges of the feathers dotted with whitish; white beneath, spotted with grey on the forepart of the neck and on the sides; only three black bands on the lower half of the tail; feet, greenish; still smaller than either of the two preceding ones. It is much esteemed as game, and is common along the banks of rivulets in Europe, although it is rather a solitary bird.

Tringa glareola, Gm.; *Bécasseau des bois*, chiefly differs from the preceding in having from seven to eight blackish stripes along the whole length of the tail. The pale spots on its back are broader. The spots on the neck and breast almost totally disappear in winter.

Tot. macularius, Wils. VII, lix, 1, 2?(2) *Tringa hypoleucos*, *L.*; *La guignette*, Enl. 850. The smallest of the European species, being about as large as a Pelidna (*Tr. alpina*, Gm.); a bronzed greenish-brown, with transverse, fawn coloured and black marks on the wings; beneath and in front, white; rump, and the middle quills of the tail, colour of the back, the lateral ones only being striped with black and white as in the

(1) Under the wrong name of *Barge grise.*

(2) This mark of doubt may be removed: it is *not* the *Tot. macularius*, Wils. *Am. Ed.*

other species. The feathers of the beak as well as the small wing-coverts, when young, have a light fawn coloured edging. Its habits are the same as those of the preceding.

Among the species foreign to Europe, we should particularly notice that of North America, with the large beak and semipalmated feet, *Scolopax semipalmata*, L.; Ency. Method. Pl. Ornith., pl. lxxi, fig. 1; Wils. VII, lvi, 3, which is nearly as large as the one first named, with a shorter and thicker beak, plumage brown-grey above, whitish beneath; brownish spots on the neck and breast; toes well bordered with equal and considerable membranes.(1) The

Lobipes, Cuv.(2)

We think requires to be separated from Phalaropus, because although the feet are similar, the bill is that of a Totanus; such is

Tringa hyperborea, L.; *Lobipède à hausse-col;* Enl. 766, of which the *Tringa fusca*, Edw. 46, is probably the female or the young. This little bird, which is grey above, white beneath, and has its scapulars tinged with red, has a broad red gorget round its white throat.(3)

Himantopus,(4) Briss.

The bill round, slender and pointed, even more so than that of a

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(1) It is on this character that M. Ch. Bonaparte founds his subgenus Catoptrophorus. Add to the common species, *Tot. speculiferus*, which resembles the *semipalmatus*, but stands higher, and has a longer beak, with the usual feet;—*Tot. vociferus*, Wils. VII, lviii, 5, or *Tot. melanoleucos*, Ord, Ib.;—*Tot. flavipes*, Wils., LVIII, 4;—*Tot. solitarius* (*Tot. glareolus*, Wils.), Wils., VII, lviii, 3. [*See App. XXIV of Am. Ed.*] The *Tot. Bartramius*, Wils., VII, lix, 2, has a proportionally shorter beak than the other species, although in every thing else its characters are the same.

N.B. This genus, mixed up by Buffon with several varieties of Ruffs, has been distributed by Linnæus, without any reason, among his two genera *Scolopax* and *Tringa*. This confusion is not yet dissipated, as I had no opportunity of observing all the foreign species. It is easy to see, however, that I could not retain the genus Atites of Illiger.

I should also observe, that the most exact descriptions will not suffice for distinguishing the species with certainty, until those of my Totanus are separated from my Sandpipers and Godwits, according to the forms of the beak, as above mentioned. It is this which has prevented me from giving all the synonymes of Beehstein and Meyer.

(2) M. Vieillot, to have the air of producing a change, retains here the name of *Phalaropus*.

(3) Add the *Phal. frenatus*, Vieill. Gal. pl. 271, or *Phal. liseré*, T. Col. 270; Wils., IX, pl. lxiii, f. 3? It is the subgenus Holopodius of Ch. Bonap.

(4) *Himantopus*, feet like a string, (alluding to their weakness) is the name given to this bird in Pliny.

Totanus, and the nasal grooves occupy but half its length. The excessive length and tenuity of the legs which are reticulated and destitute of a thumb, and the weakness of their bones, which is so extreme as to render walking painful to them, are what principally distinguish the species of this subgenus, and give rise to their name.

One species only is known in Europe,—*Charadrius himantopus*, L., Enl. 878, which is white, with a black calotte and mantle, and long red feet; it is a rare bird whose habits are but imperfectly known.(1)

This is perhaps the only place for the

Recurvirostra, Lin.

Or the Avosets, although their feet, which are webbed to near the ends of the toes, almost entitle them to a situation among the Palmipedes; but their high tarsi and half naked legs, their long, slender, pointed, smooth, and elastic bill, together with the mode of life resulting from this conformation, equally approximate them to the Snipes. What particularly characterizes, and even distinguishes them from all other birds, is the strong upward curve of their beak. Their legs are reticulated, and their thumb much too short to reach the ground.

The European species,—*Recurv. avocetta*, L., Enl. 353, is white; a black calotte and three bands on the wing of the same hue; feet, lead-coloured; it is a pretty bird of a graceful form, found in winter on the sea shore. The American species,—*R. americana*, Wils. VII, lxiii, 2; Leach, Zool. Misc., pl. 101, differs from it in a red hood.

The coasts of the Indian seas produce a third which is white, with black wings and red feet, the *R. orientalis*, Cuv.(2)

FAMILY V.

MACRODACTYLI.

This family is furnished with very long toes, fitted for walking on the grass of marshes, and even for swimming, in those numerous species especially, in which they are bordered with a membrane. There are no membranes, however, between

(1) Add, *Him. nigricollis*, Wils. VII, pl. lviii, 2, and Vieill. Gal. pl. 229.

(2) Vieillot has changed this name into *Recurvir. leucocephala*, Gal. pl. 272.

the bases of their toes, not even between the external ones. The beak, more or less compressed on the sides, is lengthened or shortened according to the genus, never, however, becoming as slender or as weak as that of the preceding family. The body of these birds is also singularly compressed, a circumstance which is owing to the narrowness of the sternum; their wings are moderate or short, and their flight feeble. They all have a long thumb.

They have been divided into two tribes according to the armature or non-armature of their wings; but this character is liable to exceptions.

Jacanas, Briss.—Parra, Lin.(1)

The Jacanas are greatly distinguished from the other Grallatoriæ by having four very long toes, separated down to their root, the nails of which, that of the thumb in particular, are also extremely long and pointed, from which peculiarity, they have received their vulgar name of *Surgeons*. The beak is similar to that of the Lapwings in its moderate length, and in the slight inflation of its end. Their wing is armed with a spur. They are noisy and quarrelsome birds, which inhabit marshes of hot climates, where they walk with great facility by means of their long toes.

America produces some species in which the base of the bill is covered by a flat, naked membrane, which extends to part of the forehead.

P. jacana, L. Enl. 322. (The Common Jacana.) Black, with a red mantle; the primary wing-quills green; fleshy wattles under the beak; very sharp-pointed spurs. It is the most common species in all the hot climates of America.(2)

Some of the same description are also found in Asia,

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(1) *Jacana*, or *Jahana*, is properly, in Brazil, the name of the *Gallinulæ*. The *Surgeons* are there called *Aquapuazos*, because they walk over the aquatic plants called *Aquape* (Azzar.). It is possibly through an error of transcription that one of them in Marcgrave is named *Aguapeccaca*.

Parra is the Latin name of some unknown bird.

(2) The *J. varié* (*P. variabilis*), Enl. 846, is only the common species at an early age. The *P. brasiliensis* and the *P. nigra* exist only on the somewhat equivocal authority of Marcgrave. The *P. viridis*, which also rests on the description of Marcgrave, appears to me, from the description itself, to be a Porphyrio. The *P. africana*, Lath. scarcely differs. As for the *P. chavaria*, see the following article on the Palamedeæ.

P. ænea,(1) with a black body reflecting blue and violet tints; mantle bronze-green; rump and tail blood-red; anterior quills of the wing green; a white streak behind the eye. Its spurs are blunt and small.

Others have been discovered in the East, in which this membrane is deficient, and which are otherwise remarkable for some singular differences in the proportions of their quills.

P. chinensis; Jacana à longue queue; Encycl. Method., Orn. pl. 61, f. 1; Vieill. Gal. 265. (The Long-tailed Jacana.) Brown; head, throat, front of the neck and coverts of the wings white; back of the neck furnished with silky feathers of a golden yellow; a small pediculated appendage to the end of some of the wing-quills; four quills of the tail black, and longer than the body. The *Chirurgien de Luçon* of Sonnerat, (*P. luzoniensis*,) is the young of the same: independently of some difference in the colours, it has not yet acquired its long tail.

The East produces others which are tufted, and in which the spur on the wing is deficient, *P. gallinacea*, Tem. 464.

Palamedea, Lin.

The Kamichi resemble the Jacanas, but on a very large scale, in the two strong spurs of each of their wings, in their long toes and strong nails, that of the thumb in particular, which is long and straight as in the Larks; but their beak, whose aperture is small, is but slightly compressed, and is not inflated; the upper mandible, also, is somewhat arcuated. Their legs are reticulated. The species known,

P. cornuta, L., Enl. 451; Vieill. Gal. 261; *Anhima* in Brazil; *Camouche* at Cayenne, &c. is larger than the Goose, blackish, with a red spot on the shoulder, and a singular appendage on top of the head, consisting of a long, slender, mobile and horny stem. There are no membranes between the toes. This bird is found in the inundated places of South America, and has a very loud cry. It is a strict monogamist. It has been said that it hunts reptiles, but though its stomach is but slightly muscular, it rarely feeds on any thing but aquatic plants and seeds.(2)

A distinct genus has been made of another,

Chauna, Illig.(3)

Parra chavaria, L.; *Chaïa* of Paraguay, Azzar.; Col. 219;

(1) Vieillot has changed this specific name into *melanchloris*, Gal. 264. It is also the *P. superciliosa*, Horsf. Jav.

(2) Bajon., Mem. sur Cayenne, II, 284.

(3) Vieillot has changed this name into Opistolophus.

Vieill. Gal. 267, which has no horn on the vertex, and whose occiput is ornamented with a circle of erectile feathers. The head and upper part of the neck are only covered with down, and it has a black collar. The rest of its plumage is lead-coloured, and blackish with a white spot on the tip of the wing, and a second over the base of some of the large quills. The external toes are considerably palmated. It chiefly feeds on aquatic plants, and the Indians of Carthagena always keep some of them among their geese and chickens, as it is sufficiently courageous, according to them, to repulse even the Vulture. A singular circumstance attending this bird is, that air is every where interposed between the skin and muscles, even on the legs, in such a quantity as causes it to crackle under the finger.

Although there is scarcely any part of the leg naked in(1)

MEGAPODIUS,

We still think it should be placed near Palamedea. It is a genus lately discovered in New Guinea, in which the bill is arched and slightly compressed, the membranous nostrils occupying about the one half; the legs are strong, high, and scutellated; the thumb and toes long, and terminated by large nails somewhat flattened; the tail is short, the circumference of the eye partly naked, and there is a small tubercle on the carpus, the first and slight vestige of the spur of the Palamedeæ. The membrane between the external toes is very short; between the internal ones it is somewhat larger. The eggs are very disproportionate in size to that of the bird.

One species is tufted almost like the Chavaria,—the *Megap. Duperrey*, Less. and Garn., Voy. de Duperr. Zool., pl. 37. Two others, the *M. de Freycinet* and *M. de Lapeyrouse*, Quoy and Gaym. Voy. de Freycin. pl. 28 and 27, and Col. 220, are destitute of the tuft.(2) A fourth, which is smaller, the *Alectelie de Durville*, Voy. de Dup., pl. 38, appears to have no tail.

Of the tribe whose wings have no armature, Linnæus comprises in his genus *Fulica* such as have their beak prolonged into a sort of shield, which partly covers the forehead; and in his genus *Rallus*, those in which this peculiarity does not exist. [*See App. XXV of Am. Ed.*]

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(1) There is scarcely any part of the leg naked in the *Rallus Crex*.

(2) The *Mégap. Duperrey* is called *Tuvon* in Manilla. Although hardly as large as a Partridge, it lays an egg equal in size to that of a Goose. Add the *Mégap. à pieds rouges*, Col. 411.

Rallus, Linn.

The Rails, which, in other respects, have a strong, mutual resemblance, present bills of very different proportions.

Among the species in which it is longest, the Rallus, Bechst., is placed

Ral. aquaticus, L.; *Rale d'eau d'Europe*, Enl. 749; Naum. 20, f. 41. (The Water Rail.) A fawn coloured brown, spotted with blackish above; bluish ash colour beneath; the flanks striped with white and black; common in ponds, &c., where it swims well, and runs lightly over the leaves of aquatic plants; it feeds on small shrimps, and its flesh has a marshy odour.(1)

Other species have a shorter beak, Crex, Bechst., among which we find

Ral. crex, L.; *Le Rale de genêts*, Enl. 750; Frisch, 212, B; Naum. 5, f. 5. Fawn coloured brown, spotted with black above; greyish beneath; flanks streaked with black; red wings. It lives and builds in the fields, running through the grass with great celerity. Its name, *Crex*, expresses the sound of its note. It has been called the *Quail-King*, because it arrives and departs with those birds, and leads a solitary life on the same grounds, from which arose the conjecture that it was their leader. It feeds on grain, as well as on worms and insects.

Ral. porzana, L.; *La Marouette*, Enl. 751; Frisch, 211; Naum. 31, f. 42. (The Little Spotted Rail.) A deep brown dotted with white; flanks marked with whitish stripes; found in the vicinity of ponds, and constructs a nest with reeds, that has the form of a wherry, which it fastens to the stem of some one of those plants; it is a good swimmer and diver, and does not leave France till the middle of winter.(2)

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(1) There is a variety or species at the Cape, *Rallus cærulescens*, Cuv., the black and white stripes of whose abdomen are merely a little more extended. Add of the Water Rails: *Ral. virginianus*, Edw., 729; Wils. LXII, 1;—*crepitans*, Ib. 2;—*longirostris*, Enl. 849;—*variegatus*, Enl. 775;—*philippensis*, Enl. 774;—*torquatus*;—*striatus*;—the *Fulica cayennensis* (which is a true Rail), Enl. 352, as well as the *Gallinula gigas*, Spix, xcix;—*sarracura*, Id. XCVIII;—*mangle*, Id. XCVII;—*ruficeps*, Id. XCVI, and *cæria*, Id. XCV.—The *Ral. fuscus*, Enl. 773, begins to have a shorter bill.

(2) There are two other Rails in Europe with short beaks, smaller than the porzana, *R. Baillioni*, Vieill. Dict., and *R. pusillus*, Naum., 32, F. 43. Among these short beaked Rails may be placed the *Ral. cayennensis*, Enl. 753 and 368;—*minutus*, Enl. 847;—*jamaicensis*, Edw. 278;—*noveboracensis*, Vieill. Gal. 266;—*nigro-lateralis*, Lichten.;—*carolinus*, Edw. 144, Wils. 48, 2;—*Gallinula eurizona*, T. Col. 417;—*G. rubiginosa*, Id. Col. 387.

The *Ral. benghalensis*, Gm., is a *Rhynchæa*.

Fulica, Lin.

The Coots may be divided as follows, from the form of the beak and the appliances of the feet.

Gallinula, Briss. and Lath.

Or the Water Hens. The beak very similar to that of the Ground-Rail, from which these birds are distinguished, by the shield on the forehead, and by very long toes, furnished with a very narrow border.

Fulica chloropus, L.; *La Poule d'Eau commune*, Enl. 877; Frisch, 209; Naum. 29 and 38. (The Water-Hen.) A deep brown above; slate-grey beneath, with some white on the thighs, along the middle of the lower part of the abdomen, and on the external edge of the wing. The young, *Fulica fusca*, Gm., *Poulette d'eau*, Buff., are more lightly coloured, and have a larger frontal escutcheon.(1)

Porphyrio, Briss.

The beak higher in proportion to its length; very long toes, without any very sensible border; the frontal shield large, rounded in some, and square above in others. These birds stand on one foot, using the other to convey their food to the beak. Their colours are usually fine shades of blue, violet and aqua-marina. Such is

Fulica porphyrio, L.; *Poule Sultane Ordinaire;* Edw. 87, a beautiful African bird, now naturalized in several islands and coasts of the Mediterranean.(2) Its beauty would render it an ornament to our pleasure grounds.

Fulica, Briss.

The True Coots, in addition to a short beak and a large frontal shield, have their toes much widened by a festooned border that renders them excellent swimmers, in consequence of which their

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(1) The *Poule d'eau ardoisée de l'Inde*, Vieill. Gal. 268, hardly differs from the common one;—the *P. d'eau tachetée*, or the *Grinette*, *F. nævia*, Alb., II, 73, is only a young *Ral. crex*. Add *Ral. phœnicurus*, Enl. 896.

Add *Gal. martinica*, Gm.; Wils. IX, pl. lxxiii, f. 2. *Am. Ed.*

(2) The *Ful. maculata*, *flavipes* and *fistulans*, originally rest on some bad figures of Gesner, from drawings which had been sent to him. But the *Ful. martinica* and *flavirostris* are true Rhynchæas. The *martinica* is in Vieill. Gal. 267. Add the *Talève à manteau verd* (*Porph. smaragnotus*, T.), Enl. 910;—the *T. à manteau noir* (*Porph. melanotos*, T.);—the *T. meunier* (*P. pulverulentus*, T.), Col. 405;—the *T. emeraudine* (*P. smaragdinus*, T.) Col. 421;—the *P. albus*, L. Philip., Voy. to Bot. Bay, p. 273; J. White, p. 238.

lives are passed in ponds and marshes. Their polished plumage is not less adapted to this kind of life than their conformation, and these birds establish an evident link between the order of the Grallatoriæ and that of the Palmipedes. There is but one in Europe,

F. atra, F. aterrima, and *F. æthiops*, Gm.; *La Foulque*, Enl. 197, Frisch. 208, Naum. 30, f. 40. (The Coot.) The shield of a deep slate colour; edge of the wings whitish; in the nuptial season the shield becomes red: found wherever there is a pond.(1)

We will terminate this sketch of the Grallatoriæ with three genera, which it is difficult to associate with any other, and which may be considered as forming separately so many small families.

Chionis, Foster.—Vaginalis, Lath.

Or the Sheath-Bills. Their legs are short, almost like those of the Gallinaceæ; their tarsi scutellated, their bill stout and conical, having a hard substance enveloping its base, which, it appears, the bird has the power of raising and depressing.

Only one species is known, and that is from New Holland, *Vag. Chionis*, Lath. III, pl. 89, *Chionis necrophaga*, Vieill. Gal. 258. It is the size of a Partridge, with entirely white plumage. It haunts the sea-coast, where it feeds on the dead animals thrown up by the waves.

Glareola.

The beak of the Pratincoles is short, conical, arcuated throughout, has a large opening, and resembles that of the Gallinaceæ. Their excessively long and pointed wings remind us of the Swallows,(2) or of the Palmipedes of the high seas; their legs are of a moderate length, their tarsi scutellated, and their external toes somewhat palmated; their thumb touches the ground. Aquatic worms and insects constitute their food. The European species,

Glar. austriaca, Enl. 882; *Glar. pratincola*, Leach, Lin. Trans., XIII, pl. xii; Naum., 29, F. 59, is brown above, white beneath and on the rump; a black circle round the throat; feet and base of the beak, reddish. It appears to be found in all the north of the eastern continent.(3)

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(1) Add the Coot of Madagascar (*Ful. cristata*, Gm.) Enl. 797; Vieill. Gal. 269. Add also *F. americana*, Gm.; Wils. IX, pl. lxxiii, f. 1. *Am. Ed.*

(2) Linnæus (Edit. XII) even placed the common species in the genus Hirundo, under the name of *Hir. pratincola*.

(3) *Glareola nævia*, Gm., is the young of the common species. See Leach, Lin.

Our last genus will be that of

Phœnicopterus, Lin.

Or the Flamingos, one of the most extraordinary and insulated of all birds. The legs are excessively long; the three anterior toes are palmated to their ends, and that of the hind one is extremely short; the neck, quite as long and slender as the legs, and their small head furnished with a beak whose lower mandible is an oval longitudinally bent into a semi-cylindrical canal, while the upper one, oblong and flat, is bent crosswise in its middle, so as to join the other exactly. The membranous fossæ of the nostrils occupy nearly all the side of the part which is behind the transverse fold, and the nostrils themselves are longitudinal slits in the base of the fossæ. The edges of the two mandibles are furnished with small, and very delicate transverse laminæ, which, with the fleshy thickness of the tongue, creates some affinity between them and the Ducks. Were it not for the length of their tarsi, and the nudity of their legs, we might even place them among the Palmipedes. They feed on shell fish, insects, and the spawn of fishes, which they capture by means of their long neck, turning the head on one side to give more effect to the hook of the upper mandible. They construct their nest of earth in marshes, placing themselves astride of it to hatch their eggs, a position to which they are forced to resort, by the length of their legs. The species known,

Ph. ruber, Enl. 68 (The Red Flamingo), is from three to four feet in height; ash coloured, with brown streaks, during the first year; in the second there is a rosy hue on the wings, and in the third it acquires a permanent purple-red on the back, and rose-coloured wings. The quills of the wing are black; the beak yellow, with a black tip, and the feet brown.

This species is found in all parts of the eastern continent below 40°. Numerous flocks are seen on the southern coast of France, and they sometimes ascend as far as the Rhine.

M. Temminck thinks that the American Flamingo, which is altogether of a bright red, Wils. VIII, 66, and Catesb. 73, is a different species from that of Europe.(1)

Trans. XIII, pl. xii, f. 2. Add *Glar. australis*, Leach, loc. cit. pl. xiv, or *Glar. isabella*, Vieill. Gal. 263;—*Glar. orientalis*, Leach, XIII;—*Glar. lactea*, Tem. Col. 399.

(1) M. Temminck has positively ascertained that the Flamingo of America is different from that of Europe. The latter he calls *Phæn. antiquorum*, but the American species *Ph. ruber*. *Am. Ed.*

ORDER VI.

PALMIPEDES.

These birds are characterized by their feet, formed for natation, that is to say, placed far back on the body, attached to short and compressed tarsi, and with palmated toes. Their dense and polished plumage saturated with oil, and the thickly set down which is next to their skin, protect them from the water in which they live. They are the only birds whose beak surpasses—which it sometimes does to a considerable extent—the length of their feet, and this is so, to enable them to search for their food in the depths below, while they swim on the surface. Their sternum is very long, affording a complete guard to the greater part of their viscera, having, on each side, but one emargination or oval foramen, filled up with membrane. Their gizzard is usually muscular, the cæca long, and the inferior larynx simple; in one family, however, the latter is so inflated as to form cartilaginous capsules.

This order admits of a tolerably precise division into four families.

FAMILY I.

BRACHYPTERÆ.

A part of this family has some external affinities with that of the Gallinulæ. Their legs, placed further back than in any other birds, renders walking painful to them, and obliges them, when on land, to stand vertically. In addition to this, as most of them have but feeble powers of flight, and as some of them are wholly deprived of that faculty, we may consider them as exclusively attached to the surface of the water: their plumage is extremely dense, and its surface frequently polished, presenting a silvery lustre. They swim under water, using their wings with almost as much effect as though they were fins. Their gizzard is muscular, and their cæca

moderate; the lower larynx is furnished on each side with a peculiar muscle.

Colymbus, Lin.(1)

The only particular character of the Divers is a smooth, straight, compressed and pointed bill, and linear nostrils; but the differences in the feet have caused them to be subdivided.

Podiceps, Lath.—Colymbus, Briss. and Illig.

The toes of the Grebes, instead of being palmated, are widened like those of the Coots, the anterior ones only being united at base by membranes. The middle nail is flattened, and the tarsus strongly compressed. The semi-metallic lustre of their plumage has caused it to be occasionally employed as fur. Their tibia, as well as that of the succeeding subgenera, is prolonged above into a point which gives a more efficient insertion to the extensors of the leg.

These birds live on lakes, &c., and build among the rushes. In certain circumstances, it appears that they carry their young ones under their wings. Their size and plumage are so much changed by age, as to have caused an improper multiplication of species. M. Meyer reduces those of Europe to four.

Col. cristatus, Gm., Enl. 400 and 944; Frisch, 183; Naum. 69, F. 106; *Col. urinator*, Gm., Enl. 941; Edw. 36 (The Crested Grebe), is the size of a duck; blackish-brown above, silver-white beneath; a white band on the wing; it acquires with age a double black tuft, and the adults have in addition a broad red collarette on the upper part of the neck, edged with black.

Col. cornutus, Enl. 404, 2; *Col. obscurus*, Enl. 942; and *Col. caspicus*, Gm., Vieill. Gal. 281; Edw. 145 (The Horned Grebe), resembles the preceding in form, but the collarette of the adult is black; its tufts and the front of its neck red. It is much smaller.

Col. subcristatus; and the young, *parotis* and *rubricollis*, Enl. 931; Lath. Supp. I, 118; Naum. 70, f. 107 (The Grey-cheeked Grebe), also has the front of its neck red, but the tufts of the adult are small and black, and its collarette very short and grey. Intermediate, as to size, between the two last.

Col. minor, Gm. Enl. 905 (The Little Grebe), is as large as a Quail, and has neither crest nor collarette; its plumage is brown, more or less shaded with red, the breast and belly excepted, where it is a silver-grey. The throat of the young bird is white.(2)

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(1) Colymbus, the Greek name of these birds.

(2) Add the *Pod. carolinensis*, Lath., Catesb. 41, 91, Enl. 93;—the *Gr. aur*

Heliornis, Bonnat.—Podoa, Illig.—Grebifoulques, Buff.

The feet lobulate as in the Coots and Grebes, but the tail more developed than in either of the two; the nails also are sharper.(1) [*See App. XXVI of Am. Ed.*]

Mergus, Briss.(2)—Colymbus, Lath.—Eudytes, Illig.

The true Divers have the feet of ordinary Palmipedes, along with all the forms of the Grebes, that is, the anterior toes are united to their ends by membranes, and are terminated by pointed nails. They are northern birds, which rarely breed in France, where they arrive in winter, at which season is occasionally seen on the coast,

Col. glacialis, L., Enl. 952; *Col. immer*, Gm., Wils. Am. IX, lxxiv, 3; Naum. 66, f. 103. (The Great Northern Diver.) The adult is two feet six inches in length, its head and neck black, changing to a green with a whitish collar; back, a blackish brown dotted with whitish; white beneath; the lower mandible, which has a slight curve upwards, is marked by a groove beneath. The young birds, *Col. immer*, Gm., Briss., VI, x, 1, which more frequently visit the fresh waters, differ considerably as to the extent of the black on the neck, and of the grey or brown on the back, which, added to their diminished size, has occasioned a multiplication of the number of species. We distinguish

Col. arcticus, L., Edw. 146; Naum. Supp. 30, f. 60; and the young, Enl. 914 (The Black-throated Diver), which is somewhat smaller; the back of the neck ash-coloured, and the lower mandible straight and without a groove. The young resemble those of the preceding.

Col. septentrionalis, Enl. 308; Edw. 97; Naum. 67, f. 94; Vieill. Gal. 282; *Col. stellatus*, Gm.; Buff. VIII, xxi; Enl. 992, Naum. Supp. 31, f. 62. (The Red-throated Diver.) The adult male is brown above, white beneath; face and sides of the neck ash-coloured; front of the neck red. The female and the young are brown dotted with white above, and all white beneath.

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belles joues (*Pod. kalipareus*, Less. and Garn.), Voy. de la Coq., Zool. No. 45;—the *Gr. Rolland* (*Pod. Rollandi*), Quoy and Gaym., Voy. de Freycin., Zool., pl. xxxvi.

(1) *Plotus surinamensis*, Gmel., Enl. 893;—*Heliornis senegalensis*, Vieill. Gal. 280. M. Ch. Bonap. as well as Gmelin, thinks that this genus should be approximated to that of *Anhinga*.

(2) *Mergus* (diver), the Latin name of some sea-bird difficult to determine. Linnæus, following Gesner, has applied it to the Merganser. *Eudytes*, a Greek word composed by Illiger, has the same meaning.

URIA, Briss. et Illig.(1)

The Guillemots have a bill, which, though of the general form of the preceding, is covered with feathers down to the nostrils; there is also an emargination at the point which is somewhat arcuated. Their chief character, however, consists in the absence of the thumb. Their wings, much shorter than those of the divers, scarcely enable them to flutter. They feed on fish, crabs, &c. and are found among rocky precipices when they breed.

The large species called the *Great Guillemot*, *Colymbus troile*, L., Enl. 903; Brit. Zool., pl. H; Edw. 359, 1; Frisch, 185, is the size of a Duck, the head and neck brown, back and wings blackish, and a white belly; there is a white line upon the wing formed by the tips of the secondary quills. It inhabits the extreme North, although it breeds on the rocky coasts of England and Scotland. In very hard winters it is seen on those of France.

There is a smaller species which is black, with the upper part of the wing white, *Col. Grylle*, L.; Vieill. Gal. 294; Choris., Voy. aut. du M., Isles Aleut., pl. xxii, sometimes mottled throughout with white, *C. marmoratus*, Frisch, Suppl. B., pl. 185, Edw. 50 and Penn., Arct. Zool., II, xxii, 2. Individuals are sometimes seen, all white, *C. lacteolus*, Pall.(2)

We may also separate from the Guillemots the

CEPHUS,(3)

Vulgarly called Greenland Divers, which have a shorter bill with a more arcuated back, but without any emargination. The symphysis of the lower mandible is extremely short. Their wings are larger, and the membranes of their feet well indented.

The species most known, called the *Little Guillemot* or *Greenland Dove*, *Colymbus minor*, Gm.; Enl. 917; *Mergulus Alle*, Vieill. Gal. 295; Brit. Zool. pl. H, 4, f. 1; Edw. 91; Naum. Ed. I, 65, f. 102, is the size of a large Pigeon, black above,

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(1) *Uria*, the Greek, or rather Latin name of an aquatic bird which appears to have been either a Diver or a Grebe. *Guillemot*, the English name, would seem to indicate its stupidity.

(2) Add the *G. a grosbec* (*Uria Brunnichii*, Sabine), Choris, Voy. aut. du M. pl. xxi;—*Uria lacrymans*, Lapil., Ib., XXIII—consult the article inserted there on this genus by M. Valenciennes.

(3) *Cephus*, the name of some sea bird often mentioned by the Greek writers, which appears to have been a species of Petrel or Gull. Mœhring, and subsequently Pallas, applied it to the Divers and Guillemots. Vieillot has changed it into *Mergulus*, Gal. 295.

white beneath, with a white line on the wing as in the Guillemot. Its bill is black, and feet red. Inhabits all the northern coasts, and builds under ground. It is sometimes seen on the French coast in winter.

Alca, Lin.

The Auks are known by the very much compressed, vertically raised bill which has a trenchant back, and is usually grooved transversely; and by the feet which are completely palmated, and have no thumb like those of the Guillemot. All these birds inhabit the northern seas. We may divide the genus into two subgenera.

Fratercula, Briss.—Mormon, Illig.

Or the Puffins, whose bill, shorter than the head, is as high and higher at base than it is long, which gives it a very extraordinary form; a folded skin usually covers its base. The nostrils placed near the edge are mere slits. Their small wings can just sustain them for a moment; they live upon the ocean and breed on the rocks.

The most common species, *Alca arctica*, L. and *labradoria*, Gm.; *Mormon fratercula*, Tem. Enl. 275; Brit. Zool., pl. H; Edw. 358, 1; Frisch, 192; Naum. 65, f. 101, is the size of a Pigeon, and has a black calotte and mantle; white beneath. It sometimes breeds among the cliffs on the English coast, and is very common on those of France during the winter.(1)

M. Temminck distinguishes, under the name of Stariques (Phaleris) those species which have a less elevated bill.(2)

Alca, Cuv.(3)

The true Auks have a more elongated bill, resembling in form the blade of a knife; it is covered with feathers as far as the nostrils. Their wings are decidedly too small to support them, and therefore they never attempt to fly.

Alca torda and *pica*, Gm.; *Pingouin commun*, Enl. 1004, the adult 1003, in summer plumage, Edw. 358, 2, Briss. VI, VIII, 2, Brit. Zool. pl. H, 1. (The Common Auk.) Black above, white

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(1) Add *A. cirrhata*, Pall. Spic., V, pl. 1; Vieill. Gal. 299.

(2) *Alca cristatella*, Vieill. Gal. 297, or *Starique cristatelle*, T. Col. 200, and Pall., Spic. Zool., V, pl. 1, of which *A. pygmæa* is the young;—*A. psittacula*, Pall. Spic., V, pl. 2, of which *A. tetracula*, Ib. pl. 4, is the young.

(3) *Alca*, Aik, Auk, the name of these birds in the Feroe Islands, and in the north of Scotland. That of *Penguin*, first given to the Aptenodytes of the south by the Dutch, indicates the oily nature of their fat. See Clusius, Exot., 101. It was Buffon who transferred this name exclusively to the northern Auks.

beneath; a white line on the wing and one or two on the bill. The throat of the male is black, and there is a white line reaching from the eye to the bill. Its size is that of a duck.

Alca impennis, L.; *Le Grand Pingouin*, Buff. IX, xxix; Enl. 367. (The Great Auk.) Nearly as large as a Goose, the colours very similar to those of the preceding species; but the bill is entirely black and marked with eight or ten grooves, and there is a white oval spot between the bill and the eye: its wings are shorter in proportion than those of any other species of this genus. It is said to lay but one large egg, spotted with purple.

Aptenodytes, Forst.

The Penguins are even less capable of flying than the Auks. Their little wings are covered with mere vestiges of feathers, which at the first glance resemble scales; their feet, placed farther behind than those of any other bird, only support them by bearing on the tarsus, which is widened like the sole of the foot of a quadruped, and in which are found three bones soldered together at their extremities. They have a small thumb directed inwards, and their three anterior toes are united by an entire membrane. They are only found in the Antarctic Seas, never going on shore except to breed. They can only reach their nests by drawing themselves along on their bellies. The difference in their bill authorizes their division into three subgenera.

Aptenodytes, Cuv.

A long, slender, and pointed bill; the upper mandible a little arcuated near the end; covered with feathers to one-third of its length where the nostril is placed, from which a groove extends to the point.

Apt. patagonica, Gm.; *Le Grand Manchot*, Enl. 975. (The Great Penguin.) Is the size of a Goose, slate-coloured above, white beneath; a black mask surrounded with a lemon-coloured cravatte. Found in large troops near the straits of Magellan, and as far as New Guinea. The flesh, though black, is eatable.

Catarrhactes, Briss.

The Gorfus(1) have the bill stout, but little compressed, pointed, rounded on the back, and its point somewhat arcuated; the groove

(1) *Gorfu*, a corruption of *goir fugel*, the name of the Great Auk in the Feroe Islands. See Clusius, Exot., 367. *Catarrhactes* is the Greek name of a very different bird, which could fly well, and precipitated itself from a height on its prey. It was most probably a species of Gull.

which arises from the nostril terminates obliquely on the inferior third of its edge.

Apt. chrysocoma, Gm.; *Le Gorfou sauteur*, Enl. 984; Vieill. Gal. 298. (The Jumping Gorfu.) As large as a stout Duck, black above, white beneath, and has a white or yellow tuft on each side of its occiput. Found in the vicinity of the Falkland Islands and of New Holland. It sometimes leaps out of the water while swimming, and lays its eggs in a hole on the shore.(1)

Spheniscus, Briss.(2)

A compressed and straight bill, irregularly furrowed at base; end of the upper mandible hooked, that of the lower one truncated; the nostrils exposed and placed in the middle.

Apt. demersa, Gm.; *Sphénisque du Cap*, Enl. 382, and 1005. Black above, white beneath; the bill brown with a white band on the middle; the male has a white eye-brow, black throat and a black line on the breast, which continues along each flank. Found near the cape where it breeds among the rocks.(3)

FAMILY II.

LONGIPENNES.

This family includes those birds of the high seas, which from their immense strength of wing are to be met with in every latitude. They are known by the freedom or nullity of the thumb, by their very long wings, and by their bill which is not notched but hooked at the point in the first genera, and simply pointed in the others. Their inferior larynx has but one peculiar muscle on each side, their gizzard is muscular and their cæca short.

Procellaria, Lin.

The Petrels have a bill hooked at the end, the extremity of which

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(1) Add *Apt. catarrhactes*, Edw., 49;—*A. papua*, Sonner. Voy. I, pl. 115, and Vieill. Gal. 299;—*A. minor*, Lath. Syn. III, pl. 103.

(2) *Spheniscus*, a name given by Mœhring to the Oidemia, and by Brisson to the Penguins; from Σφην (wedge).

(3) *Aptenod. torquata*, Sonner. Voy. I, 114, appears to be the female of the *Apt. demersa*.

seems to consist of a distinct piece articulated with the remainder. Their nostrils are united and form a tube laid on the back of the upper mandible; there is a nail planted in the heel, but no thumb. Of all the Palmipedes, these remain most constantly at a distance from land, and when a tempest supervenes, they are forced to seek shelter on reefs and ships, from which circumstance they derive their name of Storm Birds: that of Petrel—Little Peter—has been given to them on account of their habit of walking on the water, which they effect by the aid of their wings. They make their nests in holes of rocks, and eject on those who attack them an oily fluid with which their stomach seems to be always filled. The greater number inhabit the Antarctic Seas.

Those species are more particularly called Petrels—Procellaria—whose lower mandible is truncated.

Proc. gigantea, Gm.; *Petrel géant; Quebranta huessos;* Lath. Syn. III, pl. 100 (The Giant Petrel), is only found in the South Seas. It is the largest of all the species, surpassing the Goose in size. Its plumage is blackish, though there are some varieties in which it is more or less white.

Proc. capensis; Petrel du Cap, &c. Enl. 964 (The Cape Petrel), is the size of a small Duck, white above, spotted black and white beneath. It is found in the same seas as the preceding species, and is frequently spoken of by navigators.(1)

Proc. glacialis; Fulmar; Petrel de Saint-Kilda, Enl. 59; Brit. Zool. pl. M, f. 1. (The Fulmar.) White, with an ash-coloured mantle; bill and feet yellow; size of a stout duck. It breeds among the cliffs on the coasts of the British islands, and of the whole north.(2)

Certain small species, with a somewhat shorter bill and rather longer legs and black plumage, the Thalassidroma, Vigors, are particularly designated by sailors under the name of *Storm Birds.*(3)

The most common, *Proc. pelagica*, Briss. VI, xiii, 1; Wils. VII, lix, 6; Edw., 90, is scarcely larger than a Lark; stands high; all brown except the rump which is white, and a white line on the end of the great wing-coverts. When it seeks shel-

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(1) Better known to mariners as the *Cape Pigeon. Am. Ed.*

(2) Add the *Petrel hartie*, Temm., Col. 416;—the *Petrel bérard*, Freycinet, 37;—*Proc. cinerea*, Lath.;—*Proc. desolata*, Id.;—*Proc. turtur*, Forst.

(3) The "*Mother Carey's Chickens*" of the English and American seamen. *Am. Ed.*

ter on a vessel, it may be considered as the forerunner of a hurricane.(1)

We separate, with Brisson, under the name of

PUFFINUS,

Or Puffins, those in which the end of the lower mandible is curved downwards along with that of the upper one, and in which the nostrils, although tubular, do not open by one common orifice, but by two distinct holes. Their bill also is proportionally longer.

Proc. puffinus, Gm.; *Puffin cendré*, Enl. 962. Cinereous above; whitish beneath; wings and tail blackish: the young is darker. Its size is that of a Crow. Very common in almost every sea.(2)

There is a species, long confounded with the preceding one, which is not larger than a Woodcock, and which breeds in immense numbers on the northern coasts of Scotland and the neighbouring islands, whose inhabitants salt them for their winter provision. It is black above and white underneath, the *Procellaria Anglorum*, Tem. Edw., 359.

Navigators occasionally speak of some birds of the Antarctic seas by the name of Petrels, which may constitute two separate genera. They are the

PELECANOIDES, Lacep.—HALODROMA, Illig.,

Which have the bill and figure of the Petrels, with a dilatable throat like that of the Cormorant, and are without the vestige of a thumb like the Albatross. Such is *Procellaria urinatrix*, Gm.

PACHYPTILA, Illig.

Or the Prions, Lacep., which, similar in other respects to the Petrels, have separate nostrils like a Puffin, the bill widened at base, and its edges furnished internally with very delicate, vertical and pointed laminæ, analogous to those of Ducks. Such are the Blue Petrels, *Proc. vittata* and *cærulea*, Forst.

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(1) The fig. Enl. 933 is a closely allied species of the South Seas (*Proc. oceanica*, Forst.)—Add *Proc. Leachii*, Tem. Act. de phil., VI, pl. 9, f. 1;—*Proc. Wilsonii*, Ch. Bonap.; Wils. VII, lxx, 6, Id. Act. de phil. VI, pl. 9, f. 2;—*Proc. fregatta*, Lath., Rochef., Antill., p. 152;—*Proc. marina*, Vieill. Gal. 292.

(2) Add *Proc. obscura*, Vieill. Gal. 301;—and *Proc. pacifica*, or *fuliginosa*, White, 252, which perhaps does not differ from the *Proc. æquinoctialis*, Edw., 89.

Diomedea, Lin.(1)

The Albatross is the most massive of all aquatic birds. The large, strong and trenchant bill is marked with sutures, and is terminated by a stout hook, which seems to be articulated with it. The nostrils resemble short rolls laid on the sides of the beak; there is no thumb, not even the small nail that is observed in the Petrels. They inhabit the South seas, and feed on Mollusca, &c.

D. exulans, L., Enl. 237; Vieill. Gal. 293, is the species best known to navigators, who, on account of its size, white plumage, and black wings, and because it is particularly common beyond the tropic of Capricorn, have called it *The Cape Sheep*. The English also style it the *Man of War Bird*, &c. It is the great enemy of the Flying-fish. It constructs a high nest of earth, and lays a number of eggs, which are considered good food. The cry of this bird is said to be as powerful as that of the Ass.(2)

Various Albatrosses, more or less brown or blackish, have been observed; but whether they form varieties of the exulans, or are distinct species, has not yet been ascertained.(3)

Larus, Lin.(4)

The Gulls have a compressed, elongated, pointed bill, the superior mandible arcuated near the end, and the inferior forming a salient angle beneath. The nostrils, placed near its middle, are long, narrow, and bored quite through; their tail is full, their legs tolerably long, and their thumb short. They are cowardly and voracious

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(1) *Diomedea*, the ancient name of certain birds of the Island of Diomedes, near Tarentum, which were said to receive the Greeks favourably, and to attack the barbarians. As to the word *Albatross*, I find that the early Portuguese navigators called the Boobies and other oceanic birds *Alcatros*, or *Alcatrass*. Dampier applied this name to the present genus, Grew changed it into *Albitross*, and Edwards into *Albatross*.

(2) The cry of the Albatross has been quite as much exaggerated as its size. I have repeatedly heard it when within a hundred yards of the bird, and from various individuals, some of large size, and consequently adults—it is a piping kind of clang, deeper than that of a Goose, but something like it. *Am. Ed.*

(3) Such is the *Diom. spadicea*—Add *D. brachyura*, Tem. Enl. 963;—*D. melanophris*, T. Col. 456;—*D. chlororhynchos*, Lath. V, pl. xciv, Col. 468;—*D. fuliginosa*, Col. 469.

(4) *Larus*, the Greek name of these birds, *Gavia* in latin, whence *Gabian* in Provence; they are called *Mauves*, or *Mouettes*, in French, from their German name *Mœve*.

birds, which swarm along the sea coasts, feeding on fish, the flesh of dead bodies, &c. They breed in the sand, or in clefts of rock, laying but few eggs. When they fly into the country, bad weather may be expected. Several species are found on the coast of France, and, as their plumage is greatly changed by age, the number has been still more increased. When young, they are usually spotted with grey. Buffon calls

Goelands,(1)

The large species whose size exceeds that of a Duck. One of the largest is,

Lar. marinus and *nævius*, Gm.; *Goëland à manteau noir*, Enl. 990 and 266 (The Great Black-backed Gull), which, at first spotted with white and grey, afterwards becomes all white, with a black mantle; the beak is yellow, with a red spot underneath; feet, reddish.

Lar. glaucus, Gm.; *Burgomestre;* Naum. Ed. I, 36, is nearly as large, and only differs from it in the mantle, which is a light ash colour. Its young also are spotted.(2) The

Mauves or Mouettes

Are the smallest species.

Lar. fuscus, L.; *Lar. flavipes*, Meyer, Frisch, 218; Naum. Ed. I, f. 51, B. (The Silver Gull.) Is all white; the mantle excepted, which is black; the feet are yellow.

Lar. eburneus, Gm.; *Mouette blanche*, Enl. 994. (The Ivory Gull.) All white, with black feet. From Spitzberg and Greenland: sometimes wanders into Europe.

Lar. cyanorhynchus, Meyer; *Mouette à pieds bleus*, Enl. 977, Briss. VI, xvi, 2. (The Common Gull.) When old, of a beautiful white, with a light ash coloured mantle; the primary quills of the wing partly black, with white spots at their tips, the feet and bill, lead coloured. Feeds on shell fish.

Lar. ridibundus, L.; *L. hybernus*, and *L. erythropus*, Gm.; *La M. à pieds rouges*, Enl. 969 and 970; Briss. VI, xvii, 1. Is very similar to the preceding, except that when young the tip of the tail is black, and that there are some black and brown on the wing: in spring the head of the adult becomes brown, and re-

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(1) *Goëland*, a corruption of *Gull, Gull-ent.*

(2) M. Temminck distinguishes the *Lar. argentatus*, Lath. Enl. 253.—Add the *Goëland leucomele*, Vieill. 61, and the *Goël. à tête noire du Bengale.* [Add *L. capistratus*, Temm.;—*L. canus*, L. Enl. 977;—*L. argentatus*, Brunn. Enl. 253;—*L. argentatoides*, Brehm. *Am. Ed.*]

mains so during the summer—Enl. 970; the feet and beak are more or less red. It has been called, from its note, the *Laughing Gull.*(1)

Lar. tridactylus, and *Lar. rissa*, Gm.; *La M. à trois doigts*, Briss. VI, xvi, 1, and xvii, 2, is also very similar to the preceding species, but may be distinguished by its very short and imperfect thumb. When young it is more or less spotted with black or brown, Enl. 387.

LESTRIS, Illig.(2)—STERCORARIUS, Briss.—LABBES, Buff.

These birds have very properly been separated from the Common Gulls. Their membranous nostrils, larger than those of the latter, open nearer to the point and edge of the beak; their tail is pointed. They pursue the small Gulls with singular ferocity to rob them of their food, and, as it is said, to devour their excrement. Hence their name.

Lar. parasiticus, Gm.; *Labbe à longue queue*, Enl. 762; Edw. 148. (The Arctic Gull.) A deep brown above, white beneath; the two middle quills of the tail are double the length of the others. It is very rare in France. When young it is all brown, and is then the *Lar. crepidatus*, Gm.; Enl. 991, or better, Edw. 149.(3)

The arctic regions produce a species the size of a Goëland, which is brown, with the base of the wing-quills white, *Lar. cataractes*, Gm., Brit. Zool. pl. L., 6; and another the size of a Mouette, brown above, white underneath, with a brown collar on the breast, the *Lestris pomarinus*, Tem.(4)

STERNA, Lin.(5)

The Terns, or Sea-Swallows, derive this latter appellation from their excessively long and pointed wings and from their forked tail,

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(1) Add *Lar. atricilla*, Pall. Nov. Com. Petr., XV, xxii, 2; Catesb., I, 89; Wils. IX, lxxiv, 4, by the name of *ridibundus;—Lar. leucopterus;—L. cirrhocephalus*, Vieill. Gal. 289, or *poliocephalus*, Licht.;—*L. leucophthalmus*, Licht. Col. 366;—*L. Sabini*, Leach;—*L. minutus*, Falk. Voy. III, xxiv;—*L. melanurus*, T. Col. 459, and Tiles, Voy. de Krusenst., pl. lvii.

(2) Λῃστης, thief, the name of these birds among the Swedish fishermen. Vieillot has changed these names to STERCOREUS.

(3) This is clearly a mistake. The *L. crepidatus*, Brehm. is identical with the *L. Buffonii*, Boie, Enl. 762. *Am. Ed.*

(4) I cannot affirm the identity of the *Lestris catarractes*, Freycin., 38, and of the *Stercorcus pomarinus*, Vieill. Gal. 288, with the above species.

(5) Stern, or Tern, is their English name, latinized as above by Turner, and admitted by Gesner.

which render their flight and carriage analogous to those of Swallows. Their bill is pointed, compressed, and straight, without curve or projection; the nostrils, placed near its base, are oblong and pierced quite through; the membranes which unite their toes are deeply emarginate, consequently they swim but seldom. They fly over the waves in every direction and with great rapidity, uttering loud cries, and skilfully raising from the surface of the water the Mollusca and small Fish on which they feed. They also penetrate to the lakes and rivers of the interior. The most common species that is found on the fresh waters of France in the spring is,

St. hirundo, L.; *Le Pierre-Garin*, &c., Enl. 987; Frisch, 219; Naum. 37, f. 52; Wils. VII, lx, 1. (The Common Tern.) In the adult state, white with a light ash-coloured mantle, black calotte, red feet, and red bill with a black point. It is about one foot long, and two feet from the tip of one wing to that of the other.

St. minuta, L.; *Petit Hir. de mer*, Enl. 996; Wils. V, lx, 2; Naum. 38, f. 55. (The Small Tern.) Only differs from the preceding by being a third smaller, and having a white forehead. *St. cantiaca*, Albin. II, lxxxviii; *Hir. de mer a bec noir*, is larger than *S. hirundo;* the beak is black, with a yellow point: the *St. striata*, Gm., Lath. VI, pl. 98, is its young.

St. caspia, Pall. Sparm., Mus. Carls., lxii; Meyer, Ois. d'Allem., II, vi; Sav., Egypt., Ois. pl. ix, F. 1. (The Caspian Tern.) The largest of the European species; white, with an ash coloured mantle; occiput, black and white mixed; red beak and black feet.

St. nigra, fissipes and *nævia; Hir. de mer noire*, Enl. 338 and 924; Frisch, 220. (The Black Tern.) The tail less forked; when young, its mantle is spotted with black; the adult is almost entirely of a blackish ash colour.

Among the species foreign to Europe, we should notice the *Hir. de mer à aigrettes*, *St. inca*, Less. and Garn., from the coast of Peru, Voy. de la Coq., Zool. pl. 47, which is black; red bill and feet; a band on the cheek, and the feathers of the ear pendent and white.(1)

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(1) Add of Europ. Spec.: *St. Dougalii*, Montag.; Vieill., Gal. 290;—*St. anglica*, Id., or *aranea*, Wils. VIII, lxxii, 6;—*St. arctica*, Tem.;—*St. leucopareia*, Natter.;—*St. leucoptera*, Tem., Schinz., Ois., de Suisse, frontisp.

Of spec. foreign to Europe: *St. cayana*, Enl. 998;—*St. melanauchen*, Tem. Col. 427;—*St. melanogaster*, Id. Col. 434;—*St. fuliginosa*, Wils.

We may also distinguish from the other Terns,

THE NODDIES,

Whose tail is not forked, and is nearly as long as the wings. There is a slight projection under their bill, the first indication of that in the Mauves. But one species is known,

St. stolida, L.; *Noddi noir*, Enl. 997 (The Noddy), which is a blackish brown, top of the head whitish. Celebrated for the blundering manner in which it throws itself on vessels.(1)

RHYNCHOPS, Lin.

The Skimmers resemble the Terns in their small feet, long wings and forked tail, but are distinguished from all birds by their extraordinary bill, the upper mandible of which is shorter than the other, both being flattened so as to form simple blades, which meet without clasping. Their only mode of feeding is by skimming their aliment from the surface of the water with the lower mandible, which they effect while on the wing. One species,

Rhym. nigra, L., Enl. 357 (The Black Skimmer), is white, with a black mantle and calotte; a white band on the wing; outside of the external quills of the tail white; bill and feet red; hardly as large as a Pigeon. From the vicinity of the Antilles.(2)

FAMILY III.

TOTIPALMATÆ.

The birds of this family are remarkable for having the thumb united with the toes by one single membrane, a mode of organization that renders their feet complete oars, notwithstanding which, they perch upon trees, being almost the only Palmipedes who do so. They all fly well and have short feet. Linnæus separated them into three genera, the first of which it was necessary to subdivide.

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(1) The *St. philippensis*, (Sonner. Voy. I, pl. lxxxv,) does not appear to differ from the *stolida;*—the *St. fuscata*, Lath., Briss., VI, pl. xxi, 1, also seems to belong to this subgenus, as well as the *St. tenuirostris*, T. Col. 202.

(2) Add *Rhyn. flavirostris*, Vieill. Gal. 291;—*Rh. cinerascens*, Spix, CII;—*R. brevirostris*, Id. CIII.

Pelecanus, Lin.

The Pelicans comprise all those in which the base of the bill is found to have some part destitute of feathers. Their nostrils are fissures, the apertures of which are scarcely perceptible. The skin of their throat is more or less extensible, and their tongue very small. Their thin gizzard, with their other stomachs, forms a large sac. Their cæca are moderate or small.

Pelecanus, Illig.—Onocrotalus, Briss.(1)

The bill of the True Pelicans is very remarkable for its extreme length, its straight, very broad and horizontally flattened form, for the hook which terminates it, and for the lower mandible whose flexible branches sustain a naked membrane, susceptible of being dilated into a large sac. Two grooves extend along its length, in which the nostrils are concealed. The circumference of the eye is naked, and the tail round.

P. onocrotalus, L.; Enl. 87; Edw. 92; Frisch, 186. (The Common Pelican.) As large as a Swan, entirely white, slightly tinged with flesh colour; the hook of the bill of a cherry-red; is more or less disseminated throughout the eastern continent, breeds in marshes, and feeds exclusively on living Fish. It is said to transport both food and water in its sac. The different changes this bird undergoes from age are not sufficiently ascertained to render certain the species of its genus that are enumerated.(2)

Phalacrocorax, Briss.—Carbo, Meyer.—Halieus, Illig.

The Cormorants(3) have an elongated and compressed beak, the

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(1) *Pelecanus* and *Onocrotalus* are two Greek names of this bird Latinized.

(2) I see no difference between the Common Pelican and the *Pelec. roseus*, Sonner. Prem. Voy. pl. liv. As to the *Pelec. manillensis*, Id. LIII, Sonnerat himself says he thinks it is the young of the *roseus*. Neither can I find any difference between the *fuscus*, Edw. 93, and that of the Pl. Enl. 965, called *roseus*, but which is much more like the *manillensis*. Temminck thinks this figure represents the young of the common species. The *philippensis*, Briss., VI, pl. lvi, is the same specimen from which the Pl. Enl. 965 was taken, so that both are the young of the *onocrotalus*. That of pl. 957, also called *fuscus*, appears to be really a species identical with that of Vieill. Gal. 276.—Add the *Pel. à lunettes* (*P. perspicillátus*, T.) Col. 276.

(3) *Cormorant*, from *Cormoran*, a corruption of *Corbeau marin*, on account of its black colour. It is in fact the Aquatic Crow of Aristotle. *Phalacrocorax* (*Bald Crow*) is the Greek name of this bird, indicated by Pliny, but is not employed by Aristotle. That of *Carbo* is only used by Albert, who perhaps derived it from the German name *Scharb*. To all these names Vieillot has added that of *Hydrocorax*. Gal. 275.

end of the upper mandible hooked, and that of the lower one truncated; the tongue is very small, and the skin of the throat less dilatable; the nostrils resemble a small unpierced line, and the nail of the middle toe is notched like a saw.

The True Cormorants have a round tail composed of fourteen quills.

Pel. carbo, L., Enl. 927; the young, Frisch, 187 and 188; and Brit. Zool. pl. L, 1. (The Cormorant.) Black-brown, undulated with jet black on the back, and mixed with white near the end of the bill and front of the neck; circumference of the throat and the cheeks, white, in the male, which also has a tuft on the occiput. Its size is that of the Goose. It breeds in holes among the rocks or upon trees, and lays three or four eggs.

Pel. graculus, Gm.; Enl. 974, the young. (The Little Cormorant.) Is somewhat smaller, of a deeper black and more bronzed; no white on the front of the neck; the feathers on the back more pointed; not so common as the preceding species.(1)

Tachypetes, Vieill.

The Frigate Birds differ from the Cormorants in their forked tail and short feet, the membranes of which are deeply emarginated; in an excessive length of wing, and in a bill both of whose mandibles are curved at the point. So powerful are their wings, that they fly to an immense distance from all land, principally between the tropics, darting upon the Flying Fish and striking the Boobies to make them disgorge their prey.

One species only is well known, the *Pelecanus aquilus*, L., Enl. 961, Vieill., Gal., pl. 274, whose plumage is black, the under part of the throat and neck more or less varied with white, and the bill red. Its wings, when expanded, are said to measure from ten to twelve feet.(2)

Sula, Briss.—Dysporus, Illig.

The Boobies(3) have a straight, slightly compressed, pointed bill, the point slightly arcuated; its edges are serrated, the teeth

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(1) Add the *Cormoran longup.*, Tem. (*Pel. cristatus*, Olafs.), Voy. en Isl., tr. fr. pl. xliv, Col. 322, and Vieill. Gal. 276;—*Pel. africanus*, Lath.; Sparm. Mus. Carls., I, 10;—*Pelec. pygmæus*, Pall., Voy., App., pl. 1.

(2) Naturalists have, somewhat gratuitously, raised to the rank of species the *Pelec. minor*, Edw. 309, and *leucocephalus*, Buff. Ois., VIII, pl. xxx, and perhaps even the *P. Palmersloni*, Lath.

(3) *Sula* is the name of the common species, at the Feroe Islands, Hoyer, Clusius, Exot. 36. Booby, their English name, from their stupidity, ut sup.

inclining backwards; the nostrils are prolonged by a line which extends to near the point. The throat is naked as well as the circumference of the eye, the former not being susceptible of much dilatation; the nail of the middle toe is serrated, the wings much smaller than those of the Frigates, and the tail somewhat wedge-shaped. They are called Boobies on account of the excessive stupidity with which they permit themselves to be attacked by men and birds, the Frigate Birds particularly, which, as already stated, force them to yield up the fish they have captured. The most common is,

Pelecanus bassanus, L.; Enl. 278; Vieill.; Brit. Zool. pl. L.; Naum. Sup. 56, f. 106. (The Common Booby). White; the primary quills of the wings and the feet, black; the beak greenish; nearly as large as the Goose. It is called the *Bassan Booby* from a small island in the gulf of Edinburgh, where it is very abundant although it lays but a single egg. It is frequently seen on the coast of France during the winter. The young is brown spotted with white, Enl. 986. The remaining species are not yet sufficiently ascertained.(1)

Plotus, Lin.(2)

The Darters have the body and feet very similar to those of a Cormorant; a long neck and small head, with a straight, slender, pointed beak, whose edges are denticulated; the eyes and nudity of the face, as in the Pelicans; their habits also are similar, perching on trees.

Several species or varieties are known from the hot climates of both continents. They are not larger than the Duck, but they have a longer neck.(3) [*See App. XXVII of Am. Ed.*]

Phæton, Lin.

The Tropic Birds are known by two very long and narrow feathers that flow from their tail, which at a distance resemble so many straws. There is no naked part about the head. Their bill is straight, pointed, denticulated, and tolerably strong; their feet short and their wings long: their powers of flight are consequently great, and as they rarely quit the torrid zone, their presence announces to the mariner his vicinity to the tropics. On land, where they seldom resort except to breed, they perch on trees.

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(1) Add the *Fou brun* (*Pelec. sula*, L.), Enl. 973, Catesb. I, 87; Vieill. Gal. 277. [*See App. XXVI of Am. Ed.*]

(2) *Plotus*, or *plautus*, signifies, in Latin, flat-foot. Klein has employed it for one of his families of the Palmipedes. Linnæus applied it to the Darters.

(3) *Plot. melanogaster*, Enl. 959 and 960; Vieill. Gal. 278; Wils. IX, lxxiv, 1, 2;—Enl. 107;—Lath. Syn. VI, pl. 96:—*Anhinga Levaillant*, T. Col. 380.

A few species or varieties only are known, whose white plumage is more or less varied with blackish, and which are not larger than Pigeons.(1)

FAMILY IV.

LAMELLIROSTRES.

In this family we find a thick bill, invested with a soft skin rather than with true horn; its edges are furnished with laminæ or little teeth; the tongue is broad and fleshy, the edges notched. The wings are of a moderate length. They pass more of their time on fresh waters than at sea. The trachea of the male, in the greater number, is inflated near its bifurcation into capsules of various forms. The gizzard is large and very muscular, the cæca long. The great genus,

Anas, Lin.

Comprises those Palmipedes, the edges of whose large and broad bill are furnished with a range of thin salient laminæ, placed transversely, which appear destined to allow the water to pass off when the bird has seized its prey. They are divided into three subgenera, whose limits, however, are not very precise.

Cygnus, Meyer.

The bill of the Swans is of an equal breadth throughout, higher at base than it is wide; the nostrils about the middle of its length; the neck is very long. They are the largest birds of the genus, and feed chiefly on the seeds and roots of aquatic plants. Their intestines and cæca in particular are consequently very long. There is no inflation of the trachea. Two species are found in Europe,

Anas olor, Gm.; *Cigne à bec rouge*, Enl. 913. (The Red-billed or Domestic Swan.) Beak red, edged with black, surmounted at base by a rounded protuberance; the plumage snow-white. When young, the beak is lead-coloured and the plumage grey. This is the species, when domesticated, that forms the ornament of our ponds and grounds. Its elegance of form, graceful movements, and snow-white plumage have rendered it the emblem of innocence and beauty. It feeds both on fish and vege-

(1) *Phæt. ætherius*, Enl. 369 and 998;—*Ph. phœnicurus*, Enl. 979, Vieill. Gal. pl. 279.

tables, flies extremely high and with great swiftness, using its wings, which are a powerful weapon, in striking its enemies when attacked. It breeds among the reeds in ponds, and lays six or eight eggs of a greenish-grey.

An. cygnus, Gm.; Edw. 150; Brit. Zool. pl. 2; Naum., Ed. I, t. 13, f. 27. (The Black-billed Swan.) Bill black with a yellow base; the body white tinged with a yellowish grey—when young, all grey. This species, which is very similar externally to the preceding one, differs essentially from it internally, in the trachea, which is bent over and penetrates to a considerable extent in a cavity of the keel of the sternum, a peculiarity common to both sexes which does not exist in the domestic Swan. The latter is also erroneously called the *Wild Swan*, and the *Singing Swan*. The tale of its singing on the approach of death is a fable.

An. plutonia, Sh.; *A. atrata*, Lath.; *Cigne noir;* Nat. Misc. pl. 108; Vieill. Gal. 286 (The Black Swan), has been lately discovered in New Holland; it is the size of the common species, but its carriage is less graceful and elegant; it is all black, the primary quills excepted, which are white, and the bill with the naked skin on its base, which is red.(1)

It is impossible to separate from the Swans, certain species, much less elegant it is true, but which have the same kind of bill. Several have a tubercle at its base. The most common,

An. cygnoïdes, L.; *Oie de Guinée*, Enl. 347, is bred in poultry yards, where it mixes with the Geese. It is a whitish grey with a brown grey mantle; the male is recognised by a feathered appendage which hangs under his bill, and by a large tubercle which surmounts its base. Another species, much rarer, called by its first describers

An. gambensis, L.; *Oie de Gambie;* Lath. Syn. III, p. 2, pl. 102, is remarkable for its size, long legs, tubercle on the forehead, and for two large spurs with which its wing is armed. Its plumage is a purple black, the throat, front, and under part of the body and wings, white.(2)

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(1) The *Oie à cravatte* (*An. canadensis*, L.) Enl. 346, Wils., LXVII, 4, appears to me to be a true Swan.

(2) Buff. has confounded this Goose with a variety of the *Oie d'Egypte*, Enl. 982. The figure of Latham is defective, inasmuch as it shows but one spur; the helmet also is not salient.

This is also the place for the *Oie bronzée à crête sur le bec*, *Ipecati apoa*, of Marcgr. (*An. melanotos*), Enl. 937, Vieill. 285.

Anser, Briss.

Geese have a moderate or short bill, narrower before than behind, and higher than wide at base; their legs, being longer than those of the Ducks, and placed nearer the centre of the body, increase their facility in walking. Several of them feed on seeds and plants. There is no inflation at the root of the trachea, nor is there any curve in that organ in any of the species known.

Geese, *properly so called*,

Have a beak as long as their head; the ends of the lamellæ extend to its edges, appearing like pointed teeth.

An. anser, L. (The Common Goose), which has acquired all sorts of colours in our poultry-yards, originates from a wild species that is grey, with a brown mantle undulated with grey and an orange-coloured beak, the *Ans. cinereus*, Meyer; Albin., 90; Naum. Ed. I, pl. 41, f. 60. There is another species, however, which arrives late in the fall, and which may be known by its wings being longer than the tail, and by some white spots on the forehead; its bill is orange with a black base and point. *Ans. segetum*, Meyer, Enl. 985; Frisch, 155; Naum., I, C. 42, f. 61.

Anas albifrons, Gm.; *L'Oie rieuse;* Edw. 153; Naum. Ed. I, 43, f. 62. (The White-fronted Goose.) Is sometimes seen in France during the winter. It is grey, with a black belly and white forehead.

The north of both continents produces a fourth species.

An. hyperborea, Gm.; Wils. VIII, lxviii, 5; and the young lxix, 5; Naum. Ed. I, Sup. pl. 23, f. 46. (The Snow-Goose.) White; feet and bill red; tips of the wing-quills black. It sometimes wanders into the temperate parts of Europe during the prevalence of heavy gales in winter. The young bird is more or less grey. It is the *An. cœrulescens*, Gm., Edw. 152. The

Bernacles(1)

Are distinguished from the Common Geese by a shorter and slenderer bill, the edges of which conceal the extremities of the laminæ.

France is sometimes visited during the winter by that species from the north of Europe, which is so celebrated by the fabu-

(1) Bernacle, Scotch name of the *A. leucopsis*.

lous story of its growing on trees like fruit—*Anas erythropus*, Gm., or better *An. leucopsis*, Bechst. Enl. 885; Frisch, 189; Naum. I, c. 39, f. 77. Its mantle is ash-coloured, its neck black; cheeks, throat, belly and forehead white; the bill black and the feet grey.

An. bernicla, Gm.; *Le Cravant*,(1) Enl. 342; and better Frisch, 156; Naum. I, c. 39, f. 78; Wils., VIII, lxxii, 1 (The Brant), is from the same country. The head, neck, and quills of the wings are black, the mantle a brown-grey; a spot on each side of the upper part of the neck, and the under part of the tail, white; the bill black and feet brown.

An. ægyptiaca, Gm.; *Le Bernache armée; Oie d'Egypte, &c. &c.* Enl. 379, 982, 983 (The Egyptian Goose), remarkable for the lustre of its colours and the small spur attached to its wing, also belongs to this subgenus; it is sometimes domesticated, but always retains a propensity to return to its wild state. It is the *Chenalopex* or *Fox Goose*, held in veneration among the ancient Egyptians on account of its attachment to its young.(2) The

Cereopsis, Lath.

Is a New Holland bird very similar to the Bernacles, with a still smaller bill, the membrane of which is much broader, and extends a little upon the forehead.

Cer. cinereus, Lath., Col. 206; Vieill. Gal. 284, is the only one known. It is the size of a Goose, and of a grey colour.

Anas, Meyer.

Ducks, properly so called, have the bill broader at base than it is high, and wider at the end than towards the head; the nostrils nearer to its back and base. Their legs being shorter than those of Geese, and placed farther back, renders walking more difficult to them than to the latter. Their neck also is shorter; the trachea is inflated at its bifurcation into cartilaginous capsules, the left of which is usually the largest.

The species of the first division, or those whose thumb is bor-

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(1) *Cravant*, a corruption of *grau ent*, grey Duck.

(2) Geoff. St. Hillaire, Ménag. du Mus. d'Hist. Nat. art. Oie d'Egypte.

Add the *An. magellanica*, Enl. 1006;—*An. antarctica*, which is closely allied to it, Mus., Carls., 37, and Voy. de la Coq. Zool. 50;—*An. leucoptera*, Brown., Ill. 40;—*A. ruficollis* and *torquata*, Pall. Spicil., VI, pl. iv, which is said to penetrate as far as Germany;—*An. coromandelica*, Enl. 949, 950;—*An. madagascariensis*, Enl. 770.

dered with a membrane, have a larger head, a shorter neck, the feet placed farther back, smaller wings, a stiffer tail, more compressed tarsi, longer toes, and the membrane of the feet more entire. They walk with more difficulty, feed more exclusively on fish and insects, and dive more frequently.(1) Among them we may distinguish the

Oidemia, Fleming.

By the breadth and inflation of the bill.

Anas nigra, L.; *La Macreuse commune*, Enl. 972; Naum. Supp. 14, f. 28 and 29; Brit. Zool. pl. 2, 6; Wils. VIII, lxxii, 2 (The Scoter), is all black, greyish when young; the bill very broad with a protuberance on its base. It is found in large flocks on the coast of France, where it feeds chiefly on muscles. The *An. cineraceus*, Naum., I, C. 60, f. 91, 92, is the young female.

An. fusca, L.; *La double Macreuse*, Enl. 956; Frisch, 165; Naum. I, c. Supp. f. 15 and 16; Wils. LXXII, 3 (The Velvet Duck), differs in its superior size, a white spot on the wing, and a white streak under the eye. There is a circular, vertically flattened inflation in the middle of its trachea.

An. perspicillata, L.; Enl. 995; Edw. 155; Wils. VIII, lxvii, 1. (The Black Duck.) Some white on the occiput and behind the neck; the naked and yellow skin of the base of its bill also surrounds the eyes.

New Holland produces a speckled species, remarkable for a large fleshy appendage that hangs under its bill, *An. lobata*, Nat. Misc., VIII, pl. 255, and Col. 406.(2)

We may also separate

Clangula, Leach.

In which the bill is short and narrower towards the end; and place first on the list, those species the middle quills of whose tail are the longest, which renders it pointed. Such are

An. glacialis, L., Enl. 1008; Edw. 280; Naum. 52, f. 76; Wils. VIII, lxx, 1, 2; the young male, Enl. 999; Naum. 52, f. 76, B; the adult in wedding livery, Edw. 156. (The Long-tailed Duck.)

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(1) This division constitutes the genus Platypus, Brehm.; or Hydrobates, Tem.; or Fuligula, Ch. Bonap.

(2) Add the *Anas mersa* and *leucocephala*, Voy. de Pall. fr. tr., pl. v and vi; Naum. Sup. 40, f. 79, 80;—the *An. brachyptera*, Lath., Voy. de Freycin. pl. xxxix.

White; a fawn-coloured spot on the cheek and side of the neck; breast, back, tail, and part of the wing black. Of all the European Ducks, this has the shortest bill. Its trachea, ossified near the root, has on one side five square membranous spaces resembling so many panes of glass, above which it is inflated into an osseous capsule.

An. histrionica, L.; Enl. 798; Wils. VIII, lxxii, 4; Edw. 99; Naum. I, c. 52, f. 77; and the female, *An. minuta*, 799; Edw. 197. (The Harlequin Duck.) Ash-coloured; the male fantastically streaked with white; eyebrows and flanks red. Each of the preceding species is occasionally seen in France, but at very long intervals.

Then comes the common species with a round or square tail.

An. clangula, L.; *Le Garrot*, Enl. 802; the young, *An. glaucion*, L.(1) Frisch, 181, 182; Naum. I, c. 55, f. 81, 82; Wils. VIII, lxvii, 6. (The Golden-eye.) White; head, back, and tail, black; a small spot before the eye and two bands on the wing, white; the bill blackish. The female is ash-coloured with a brown head. The middle of the trachea is considerably dilated, the two arches of the sac, however, preserving their flexibility. It becomes singularly widened near the bifurcation.(2)

Somateria, Leach.

The Eiders have a bill longer than that of the preceding subgenus, and ascending more on the forehead where it is emarginated by an angle of feathers, but still narrower before than at base.

An. molissima; L'Eider, Enl. 208, 209, the adults of both sexes, Mus. Carls. 39; the three year old young male, Edw. 98; Wils. VIII, xci, 2, 3; Naum. 64, f. 79, 80. (The Eider Duck.) Whitish; calotte, belly and tail, black; the female grey, speckled with brown. Celebrated for furnishing us with that valuable article called eider down.(3)

After all these distinctions there remains the

Fuligula, Leach,

Whose beak is broad and flat, but presents no other peculiarity. Several species are found in France, in all of which the trachea ter-

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(1) *Glaucion*, the Greek name of a Duck, so called on account of the colour of its eyes.

(2) Add *An. albeola*, Enl. 948, the same as *An. bucephala*, Catesb., I, 95;—*An. brachyptera*, Voy. de Freycin. pl. xxxix.

(3) Add *An. spectabilis*, Sparm. Mus. Carls., II, pl. xxxvi; Edw. 154; Naum. 40, f. 58, 59.

minates in nearly similar inflations, forming on the left a partially membranous capsule, supported by a frame and ramifications of bone.

An. ferina, L.; *A. rufa*, Gm.; *Millouin commun*, Enl. 803; Naum. I, c. 58, f. 87, 88; Wils. VIII, xc, 6. (The Red-head.) Ash-coloured, finely striated with blackish; head and top of the neck red; lower part of the neck and the breast brown; the bill a light lead-colour. Sometimes breeds among the reeds in the ponds of France. Its trachea is of an equal diameter.

An. rufina, L.; *Mill. huppé*, Enl. 928; Naum. I, c. 32, f. 63, 64. (The Pochard Duck.) Black; the back brown; some white on the wing and flank; the head red, the feathers on its summit turned up into a tuft; red bill. From the borders of the Caspian sea, and occasionally driven by the winds as far as France. There are two successive inflations of its trachea, besides the capsule of the bifurcation.

An. marila, L., Enl. 1002; Brit. Zool. 2; Wils. VIII, lxix, 3; Naum. 59, f. 90; the female, *An. frænata*, Mus. Carls. 38; Naum. 59, f. 90, B. (The Scaup Duck.) Ash-coloured, striated with black; head and neck black, changing to green; black rump and tail; the belly and spots on the wing white; the bill lead-coloured; found in small flocks in France during the winter, but is from the remote parts of Siberia. Its trachea is very wide at the commencement, and then narrow.

An. nyroca, Gm.; *A. leucophtalmos*, Bechst.; the female, *A. africana*, Gm.; *Le Petit Millouin*, Enl. 1000; Naum. I, c. 39, f. 89. Brown; head and neck red; a white spot on the wing; belly whitish; a brown collar on the bottom of the male's neck. Breeds in the north of Germany, and is rarely seen in France. Its trachea is very much inflated about the middle.

An. fuligula, L.; *Le Morillon*, Enl. 1001; Frisch, 171; Naum. I, c. 56, f. 83, 84; Wils. VIII, lxvii, 5; the young, Enl. 1007; *An. scandiaca*, Frisch, VI, xxxvi, 1, 2. (The Tufted Duck.) Black; the feathers of the occiput lengthened out into a tuft; the belly and a spot on the wing white; bill lead-coloured. Found in France every winter, where it proceeds from the North.(1)

The Ducks of the second division,(2) whose thumb is not bordered with a membrane, have a more slender head, narrower feet,

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(1) Add of species foreign to Europe: *An. spinosa*, Enl. 967, 968;—*An. Stelleri*, Pall. Spic., VI, pl. v;—*An. labradora*, Wils. VII, lxix, 6;—*An. valisneria*, Ib. LXX, 5;—*An. rubida*, Ib. LXXI, 5, 6, of which, on account of its pointed tail, M. Ch. Bonap. makes his genus Oxyura.

(2) It is to this second division that M. Ch. Bonap. particularly applies the name of Anas.

longer neck, the bill more equal, and not so thick a body; they walk better, and feed on aquatic plants and seeds as much as on fish, &c. The inflations of their trachea consist of a bony and cartilaginous homogeneous substance. They also admit of some subdivisions.

Rhynchaspis, Leach.

A subgenus very remarkable for a long bill, the upper mandible of which, forming the exact half of a perfect cylinder, is widened at the end. Its lamellæ are so long and delicate that they resemble hairs. These birds feed on small worms, which they obtain from the mud on the edge of brooks, &c.

An. clypeata, L.; *Souchet commun*, Enl. 971, 972; Frisch, 161, 162, 163; Wils. VIII, lxvii, 7; Naum. 49, f. 70, 71 (The Shoveler). A beautiful duck, with a green head and neck, white breast, red belly, and brown back; the wings are variegated with white, ash colour, green, brown, &c. It visits France in the spring, and is excellent game. The lower part of its trachea is but slightly inflated. It is the *Chenerotes* of Pliny.

An. fasciata, Sh., Nat. Misc. pl. 697, is another species found in New Holland. The edges of its upper mandible are extended on each side into a membranous appendage.

Tadorna.(1)

The bill very much flattened towards the end, and bulging into a salient lump at base.

An. tadorna, L.; Enl. 53; Frisch, 166; Naum. I, c. 55, f. 103 and 104. (The Shieldrake.) The most highly coloured of all the European Ducks: white: the head green; a cinnamon-coloured cincture round the breast; the wing varied with black and white, red and green. Common on the shores of the North Sea, and of the Baltic, where it lays in the downs, and frequently in holes abandoned by rabbits. Its bifurcation is inflated into two nearly similar osseous capsules.

Some Ducks of this second division have some naked parts about the head, and very often a lump on the base of the bill.

An. moschata, L., Enl. 989, commonly but improperly called *The Muscovy Duck;* originally from South America, where it is still found in its wild state, and where it perches on trees; is now very common in our poultry yards, where it mixes with

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(1) *Tadorne*, the name of this bird in Bélon. Buffon, following Turner, mistook it for the Chenalopex of the ancients.

the Common Duck. Its capsule is very large, circular, vertically flattened, and all on the left side.

Some of them have pointed tails.

An. acuta, L.; *Le Pilet*, Enl. 954; Wils. VIII, lxviii, 3; Frisch, 160 and 168; Naum. 51, f. 74 and 75. (The Pintail.) Ash coloured above and on the flanks, finely striped with black; white beneath; the head tawny, &c. The capsule of the trachea is small.

The males of others have some of the feathers of the tail recurved.

An. boschas, L.(1) Enl. 776, 777; Wils. VIII, lxx, 7; Frisch, 158 and 159 (The Mallard), is known by its pale yellow feet, yellow bill, the beautiful changeable green of the head, and rump of the male, &c. In our poultry-yards it varies in colour, like all other domestic animals. The wild breed is common in the marshes; it builds among the reeds, in the hollow trunks of willows, and sometimes upon trees. Its trachea terminates below, in a large osseous capsule.

A singular variety is found in the *Hook-billed Duck*, the *An. adunca*, L.

Some of them have a crested head, and a bill somewhat more narrow at the end, which, though foreign, are reared in all the aviaries of Europe. Such are,

An. sponsa, L.; Enl. 980 and 981; Wils. VIII, lxxviii, 3 (The Summer Duck): and *An. galericulata*, L., Enl. 805 and 806; Vieill. Gal. 287 (The Chinese Duck). Some of the wing-feathers in the male of this latter species are widened and turned up vertically, in addition to those of the tail. Their capsules are rounded, and of a moderate size.

There are other species which to the bill of a Duck add legs, even longer than those of a Goose; they build and perch on trees.(2) Some of this number have but semi-palmated feet.(3) Finally among those which have no peculiar mark is the

An. strepera, L.; *Le Chipeau;* Enl. 958; Naum. I, c. 45, f. 65; Wils. VIII, lxxi, 1. (The Gadwal.) Reticulated and finely striped with black; wings, red with a green spot and a white one. The capsule of the trachea is small.

An. Penelope, L.; *Le Siffleur;* Enl. 825; Frisch, 164 and 169; Naum. f. 72 and 73.(4) (The Whistler.) Finely striped with

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(1) Βοσκας, Greek name of the Mallard.

(2) *An. arborea*, Enl. 804;—*autumnalis*, 826;—*viduata*, 808. [The *Anas sponsa* and the *A. moschata* likewise build on trees. *Am. Ed.*]

(3) *An. semipalmata*, Lath.; Cuv. Mém. du Mus.

(4) *Penelope*, the Greek name of a red headed Duck, either the present species or the *ferina*, L.

black; vinous-coloured breast; red head; pale forehead; the wing white, green, and black. The capsule is rounded, moderate, and very bony.(1)

There are several small species designated by the general name of Teal.

An. querquedula, L.; *La Sarcelle ordinaire*, Enl. 946, and the old male, *An. circia*, Frisch, 176; Naum. 47, f. 66 and 67. (The Garganey Duck.) A grey ground, reticulated with black; a white line round, and at the end of the eye, &c. Common on ponds, &c. Its capsule is a pyriform enlargement.

An. crecca, L.; *La petite Sarcelle;* Enl. 947; Frisch, 174; Naum. 48, f. 68, 69; Wils. VIII, lxx, 4; Brit. Zool. pl. 2. (The Common Teal.) Finely striped with blackish; the head red; a green band at the corner of the eye edged with two white lines, &c. The capsule resembles a pea.(2)

Mergus, Lin.

The genus of the Mergansers comprehends those species in which the bill, thinner and more cylindrical than that of the Ducks, is armed along its edges with small pointed teeth resembling those of a saw and directed backwards; the tip of the upper mandible is hooked. Their carriage and even plumage are those of Ducks, properly so called; but their gizzard is less muscular, and their intestines and cæca shorter. The inflation of the lower larynx in the males is enormous, and partly membranous. They live on lakes and ponds, where they are very destructive to fish.

Three species are found in France during the winter, whose variations of plumage have induced some naturalists to increase the number. It is said that they breed in the North among the rocks or reeds, and lay a great many eggs.

Merg. merganser, L.; *Le Harle vulgaire;* Enl. 951; Naum. I, c. 61, f. 93, Brit. Zool. pl. N; Frisch, 190; Wils. VIII, lxviii, 1 (The Goosander), is the size of a Duck, and has red feet and a bill of the same hue. The head of the old male is of a deep green, the feathers on its summit forming a sort of toupee; the mantle is black, with a white spot over the wing; under-

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(1) Add *An. rutila*, Pall. Nov. Com. Petrop., XIV, xxii;—*An. cana* and *casarca*, Brown, Ill. 41 and 42;—*An. pœcilorhyncha*, Indian Zool. pl. xiv;—the *Jensen* (*An. americana*), Enl. 955, Wils. VIII, lxix, 4;—the *Marec* (*An. bahamensis*), Catesb. 93;—*An. obscura*, Wils. VIII, lxxii, 5;—*An. arcuata*, Gm. or *paturi*, Spix, C.

(2) Add, *An. discors*, Enl. 966 and 403;—*An. manillensis*, Sonner. Voy. I, pl. lv.

neath and the neck, white, slightly tinged with rose-colour. The young and the females—*Merg. castor,* Enl. 953; Frisch, 191; Naum. 61, f. 93, B, are grey with a red head.

Merg. serrator, L.; *Harle huppé;* Enl. 207; Edw. 95; Naum. I, c. 61, f. 90; Wils. VIII, lxix, 2. (The Red-breasted Merganser.) Bill and feet red; the body variegated with black, white, and brown; head of a black-green; a pendent tuft on the occiput. The young and the females,—*Harles noirs*, *H. à manteau noir;* Naum. 62, f. 95, have a brown head.

M. albellus, L.; *La Piette;* Enl. 449; Frisch, 172; Naum. 63, f. 97; Brit. Zool. pl. N. 1; Wils. VIII, xci, 9. (The Smew.) Bill and feet blue; body white, varied with black on the mantle; a black spot near the eye, and one on the occiput. The young males and the females,—*Merg. minutus*, *mustelinus*, &c. Enl. 450; Brit. Zool. pl. N. 2; Naum. 63, f. 98, are grey with a red head.(1)

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(1) Among the Mergansers foreign to Europe, the only ones well ascertained are the *M. cucullatus* of Carolina, Enl. 935 and 936, and the *M. brasiliensis*, Vieill. Gal. 283.

APPENDIX

OF THE AMERICAN EDITOR.

I.

Vesp. carolinensis, Geoff. Anterior upper fore-teeth sub-simple, larger than the posterior; remarkable for a strong odour resembling that of a Fox.

V. lucifugus, L. C. Anterior upper fore-teeth bilobate; body above dark brown, beneath cinereous; nose sub-bilobate; face with a nakedish prominence on each side; ears oblong, naked, tragus sub-linear, half as long as the ears; tail projecting a little beyond the membrane; length to the insertion of the tail two inches and a quarter; tail one inch and a quarter.

V. noctivagans, L. C. Anterior upper fore-teeth bilobate, the posterior sub-simple; colour black or dusky cinereous; hair on the back and belly tipped with grey; ears short, naked, roundish; tragus short and roundish; nose sub-bilobate; tail projecting a little beyond the interfemoral membrane, which is hairy; length two inches and five eighths; tail one and three eighths.

II.

Add *Plec. macrotis*, L. C. Upper fore-teeth, four, trilobate, distant by pairs, the posterior smaller; ears very long, pointing forwards; tragus subulate, half the length of the ears.(1)

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(1) There is another species with equally long ears, which are not united on the cranium; which of these is the *megalotis* of Raffin., it is impossible to say.

III.

Nyc. noveboracensis. Easily known by its short and round ears, and by the interfemoral membrane being hairy and including the whole of the tail. There is a white spot at the insertion of the wing and another at the base of the thumb; these marks are constant. This species varies much in colour, and has been called *V. lasiurus* by Schreber, *V. monachus* by some, and is figured Wils. Orn. VI, pl. 4, whence it has been quoted by M. Cuvier as the *Taphizöus.*

Nyct. crepuscularis, L. C. Above brown, beneath paler; a small black wart above each eye; nose somewhat bilobate; chin with a small double wart; ears moderate; tragus small, subulate; tail projecting a little beyond the membrane.

Nyct. cynocephala, L. C. The posterior fore-tooth on each side smaller than the rest which are emarginate; nose furnished on the top and sides with stiff short bristles; lips very large, somewhat pendulous; ears broad, round, naked; tragus not apparent; tail long, extending far beyond the membrane; outer and inner toes of the hind feet woolly on the outside; the rest with each two long hairs on the top.

IV.

Meles europæa; Ursus meles, L. (European Badger.) Above, grey, beneath, black; a blackish band on each side of the head.

Meles labradoria; Ursus labradorius, L. (American Badger.) Above grey, beneath paler; head brown, with a narrow white line on the top; under jaw and throat white. From a comparison of these two descriptions it will be seen, that it is impossible that they can be but one species. They are totally distinct.

V.

This is the animal called the *Mink* in the United States, and is identical with the *Vison.* We have another, the *Must. Pennanti,* Erxl., the *Fisher,* as it is commonly called, which in its manners resembles the *Must. martis.*

VI.

Add to the description of *Canis lycaon,* "found also in America, in the Missouri country and in Canada." The other species, *C. latrans,* and *C. nubilus,* mentioned in note (3), page 106, are probably varieties of *C. lupus.* This animal always hunts in company, and barks when in pursuit of its prey. It varies much in colour, being grey,

reddish, black, mixed black and grey, grey and reddish, and grey, reddish and black, and in size from that of a small dog to that of the largest mastiff.

VII.

The *Canis fulvus* of some authors, the American Red Fox, is identical with the European, and was introduced (at least into the United States) by some Englishmen, who thought it afforded better sport than the American species: not many years ago persons were living who remembered when they were first brought to New England.

VIII.

This is an error. The *Sc. cinereus*, L. (The Cat Squirrel), of our country is cinereous above, beneath white, tail less distichous than that of other species, longer than the body and striped with black; length twelve inches, tail fifteen. There are but four teeth in the upper jaw on each side. Inhabits the northern and middle states.

Sc. carolinensis, L. (Little Grey Squirrel.) Above mixed white, blackish and rusty; beneath white; cheeks rusty; tail as long as the body, edged with white; upper jaw teeth, five on each side. This is the species described by our author as the *cincreus*.

Sc. vulpinus. (The Fox Squirrel.) Length fourteen inches, tail sixteen; very much resembles the *Sc. cinereus*, but differs in size and in the texture of the fur which is coarser and longer, the hair having frequently the appearance of being twisted or even geniculate. The *Sc. capistratus* is a variety of this species, and so, most probably, is the *rufiventris*. Some individuals are entirely of a rusty colour, others wholly black, and others again varied like a tortoise-shell cat. All these have been found together in the same nest. The *Sc. niger* of some authors is the black variety of these three species. The *Sc. cinereus* is sometimes found entirely white with black eyes.

The other species found in the United States are *Sc. macrourus*, Say;—*Sc. grammarus*, Id.;—*Sc. 4-vittatus*, Id.;—*Sc. lateralis*, Id.;—*Sc. hudsonius*, Gm.

IX.

Some confusion appears to exist in this note with respect to the

location of several American species, which truly belong to the Arvicola, Cuv. or Hypudæus of Illiger.

X.

Add, of American species, *Hypudæus xanthognatus*, Leach;—*Hyp. riparius?* Ord. A subdivision of this group will embrace the *Hyp. hispidus* (*Sigmodon*, Say), and *Hyp. messor*, L. C: and another subdivision, *Hyp. floridanus* (*Neotoma*, Say), and *Hyp. gossipinus*, L. C.

XI.

Here should come the new genus Psammomys, Le Conte, described Ann. Lyc. Nat. Hist. of New York, III, 3, pl. 2, which differs from all the preceding in the form of the jaw teeth. The eyes are very small, and the ears scarcely visible. It burrows like the Sorex.

But one species has yet been found—*P. pinetorum*, L. C.—which inhabits the pine forests of Georgia. Its hair is a dark shining cinereous colour, tipped above with brown, beneath a very pale ash; head large and blunt; tail round and hairy.(1)

XII.

Cathartes aura. (Turkey Buzzard.) Black, with a bluish gloss; neck feathered equally all round; head red, bill white. The other species *Cathartes iota*, Vieill. which by our author is arranged in the genus Percnopterus, undoubtedly belongs to the same genus with the *C. aura.* Its vulgar name is the Carrion Crow. Its colour is black, neck more feathered above than beneath; head black; bill horn-colour. Both these species are common in the warm parts of our country: the first, however, ranges more to the north than the other; it is sometimes seen at New York. They prey upon carrion and excrementitious matters, but never attack living animals except they perceive them helpless or unable to defend themselves.

XIII.

These citations, from *F. pennsylvanicus*, Wils. to *F. hyemalis*, Wils.

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(1) On examining the work of Ruppel lately received at the Ac. of Nat. Sc. of Philad., I find that he has anticipated Major Le Conte in the generic use of the word Psammomys. As the rule of priority should be inexorably adhered to in these cases, I would propose for the American animal the generic appellation of Pitymys, or Pine-mouse.

IV, xxxv, 1, are wrong. Instead of them should be inserted *F. pennsylvanicus*, Wils. VI, pl. liv, f. 1;—*F. velox* (Slate-coloured Hawk), Wils. VI, pl. xlvi, f. 1;—*F. dubius*, Gm. These three birds are considered (Syn. Am. Birds of Ch. Bonap.) as the same, and as identical with the *F. fuscus* of Gmel.

XIV.

Add *M. Sayi*, Bonap. Am. Or. I, pl. ii, f. 3;—*M. fusca*, Gm. Wils. Orn. II, pl. lxiii, f. 5;—*M. acadica*, Gm. Wils. II, pl. xiii, f. 3.

XV.

Here should come the genus Vireo, Vieill. (Muscicapa, L., &c.). These have a bill like the Muscicapa, but it is shorter, not so much depressed, but rather compressed; bristly at base; upper mandible curved at the tip; tongue bifid at the tip. The colour of all the species is olive, more or less inclining to yellow.

V. flavifrons, Vieill. (Wils. II, pl. 7, f. 3, *M. sylvicola*). Throat, breast, forehead, and circle round the eyes, yellow.

V. solitarius, Vieill. (*M. solitaria*, Wils. II, pl. xvii, f. 6). Head, bluish; circle round the eyes white, breast pale ash, belly white.

V. noveboracensis, Vieill. (*M. noveboracensis*, Gm., *M. cantatrix*, Wils. II, pl. xviii, f. 6). Spot at the base of the upper mandible, and circle round the eyes, yellow; eye-lids white.

V. gilvus, Bonap. (*Sylvia gilva*, Vieill., *M. melodia*, Wils. V, pl. xlii, f. 2). A line over the eyes, and body beneath, white; eye-lids, brown.

V. olivaceus, Vieill. (*M. olivacea*, L. Wils. II, pl. xii, f. 3). Crown, cinereous, bounded on the sides with black; line over the eyes, white; eye-lids, rufous.

XVI.

The *T. minor*, Gm., is quoted in this note as a synonyme of the *T. mustelinus*, Wils., when in fact it is the *solitarius*, Wils., V, p. xliii, f. 2. The *T. mustelinus*, Gm., is the *T. melodes*, Wils. I, p. ii, f. 1. The *T. mustelinus*, Wils., is the *T. Wilsonii*, Bonap. Wils. V, p. xliii, f. 3.

XVII.

Add to this note for American species; *M. aurocapilla*, L. Wils. II, pl. xiv, f. 2;—*M. noveboracensis*, Lath. Wils. III, pl. xxiii, f. 5;—*M. coronata*, Wils. II, pl. xvii, f. 4; *M. palmarum*, Bonap. II, pl. x, f. 2;—*M. maculosa*, Lath. (*Syl. magnolia*, Wils.) Wils. III, pl. xxiii, f. 2;—*M. maritima*, Wils. VI, pl. li, f. 8;—*M. pardalina*, Bonap. (*Musc. canadensis*, Wils.) Wils. III, pl. xxvi, f. 2;—*M. mitrata*, Bonap. (*Musc. cucullata*, Wils.) Wils. III, pl. xxvi, f. 3;—*M. pensilis*, (*Syl. flavicollis*, Wils.) Wils. II, pl. xii, f. 6;—*M. virens*, Wils. II, pl. xvii, f. 3;—*M. Blackburneæ*, Wils. III, pl. xxviii, f, 3;—*M. icterocephala*, Lath. (*Syl. pennsylvanica*, Wils.) Wils. I, pl. xiv, f. 5;—*M. castanea*, Wils. II, pl. xiv, f. 4;—*M. striata*, Wils. IV, p. xxx, f. 3;—*M. varia*, Lath. (*Certhia maculata*, Wils.) Wils. III, p. xix, f. 3;—*M. pinus*, Wils. III, pl. xix, f. 4;—*M. parus*, Wils. V, p. xliv, f. 3;—*M. tigrina* (*Syl. montana*, Wils.) Wils. V, p. xli, f. 2;—*M. rara*, Wils. III, pl. xlvii, f. 2;—*M. discolor* (*Syl. minuta*, Wils.) Wils. III, pl. xxv, f. 4;—*M. æstiva* (*Syl. citrinella*, Wils.) Wils. II, p. xv, f. 6;—*M. petæchia*, Wils. pl. xxviii, f. 4;—*M. americana* (*Syl. pusilla*, Wils.) Wils. IV, p. 28, xxviii, f. 3;—*M. canadensis*, Wils. II, pl. xv, f. 7;—*M. agilis*, Wils. V, pl. xxxix, f. 4;—*M. formosa*, Wils. III, pl. xxv, f. 3;—*M. autumnalis*, Wils. III, pl. xxiii, f. 4;—*M. trichas*, Wils. I, pl. vi, f. 1 and 2, pl. xviii, f. 4;—*M. philadelphica*, Wils. II, pl. xiv, f. 6;—*M. sphagnosa*, Bonap. Wils. V, pl. xliii, f. 4;—*M. azurea*, Steph., Bonap. II, pl. xi, f. 2, and Wils. II, pl. xvii, f. 5;—*M. cærulea*, Wils. II, pl. xviii, f. 5;—*M. minuta*, Bonap. (*Musc. minuta*, Wils.) Wils. VI, pl. l, f. 5;—*M. Wilsonii*, Bonap. (*Musc. pusilla*, Wils.) Wils. III, pl. xxvi, f. 4.

XVIII.

The *Mot. pensilis*, *æstiva*, *ludoviciana*, and *canadensis* quoted in this note by our author, do not belong to this subgenus. There should, however, be added for American species, *M. calendula*, Wils. I, p. v, f. 3;—*M. cristatus*, Wils. I, p. viii, f. 2.

XIX.

It may be as well to insert here the genus Icteria of Vieillot, which, from its resemblance to many of the preceding genera, al-

though it wants the emargination on the upper mandible, cannot be more appropriately arranged.

Bill strong, convex, somewhat curved, compressed, almost entire, bristly at base; mandibles sub-equal, edges somewhat bent in; nostrils round, half covered by a membrane; tongue slightly bifid at the tip; intermediate between Turdus, Muscicapa, Vireo and Tanagra. There is but one species known, *Ict. dumicola*, Vieill. which inhabits the United States (*Pipra polyglotta*, Wils. I, p. vi, f. 2). It is olive-green, with the throat and breast yellow; belly white; circle round the eyes, and line above them yellow.

XX.

Add for American species: *F. amœna*, Bonap. I, p. viii, f. 4;—*F. cyanea*, Wils. I, p. vi, f. 5;—*F. ciris*, Wils. III, p. xxiv, f. 1 and 2;—*F. americana*, Wils. I, p. iii, f. 2;—*F. leucophrys*, Wils. I, p. xxxi, f. 4;—*F. grammaca*, Bonap. I, p. v, f. 2;—*F. pennsylvanica*, Wils. III, p. xxii, f. 2;—*F. graminea*, Wils. IV, p. iii, f. 5;—*F. melodia*, Wils. II, p. xvi, f. 4;—*F. savanna*, Wils. IV, p. xxxiv, f. 4;—*F. passerina*, Wils. III, p. xxiv, f. 5;—*F. canadensis*, Wils. II, p. xvi, f. 3;—*F. socialis*, Wils. II, p. xvi, f. 5;—*F. palustris*, Wils. III, p. xxii, f. 1;—*F. caudacuta*, Wils. IV, p. xxxiv, f. 3;—*F. maritima*, Wils. p. xxxiv, f. 2.

XXI.

Add *F. psaltria*, Bonap. I, p. vi, f. 3;—*F. pinus*, Wils. II, p. lvii, f. 1.

XXII.

Add for American species: *D. vermivora*, Wils. III, p. xxiv, f. 4;—*D. prothonotarius*, Wils. III, pl. xxiv, f. 2;—*D. solitaria*, Wils. II, p. xv, f. 4;—*D. chrysoptera*, Wils. II, p. xv, f. 2;—*D. peregrina*, Wils. III, p. xxv, f. 2;—*D. rubricapilla*, Wils. III, p. xxvii, f. 3;—*D. celata*, Bonap. I, p. v, f. 2. All the birds of this genus are more nearly allied to Muscicapa and Sylvia, and ought to be arranged with them.

XXIII.

The genus Quiscalus of Vieillot should find a place between this genus and Caryocatactes. Its characters are as follows:

Bill large, compressed from the base, entire, the edges angular, hardly bent in; upper mandible curved from the middle, longer than the lower, with an osseous prominence in the middle; tongue bifid at tip; nostrils half closed by a membrane.

Q. major, Bonap. I, p. iv, f. 1 and 2 (*Gracula barrita* of authors, *Jackdaw* of the south). Black, with a blue gloss mixed with purple; head and neck purple; iris yellow. Female dusky; back, wings and tail with a slight bluish gloss; head and neck dark brown; throat, breast and belly, brown.

Q. versicolor, Vieill. Wils. III, p. xxi, f. iv (*Grac. quiscula* of authors). Black, with a bluish gloss, mixed with purple; head and neck with a purple gloss; iris yellow. Female more dusky. Both these species are similar in their manners, are gregarious, and commit great devastation in fields of grain.

Q. ferrugineus, Bonap. Wils. III, p. xxi, f. 3 (*Grac. ferruginea* of authors). Black, with feathers more or less tipped with ferruginous.

N.B. Previous to the labours of M. C. Bonaparte, these three birds were not understood. It is needless to occupy any space in commenting on the errors that have hitherto existed respecting them.

XXIV.

Add, *Tot. macularius*, Temm. Wils. VIII, p. lix, f. 1. The *Phalaropus frenatus* alluded to by our author in note (3) is *not* figured in Wilson, IX, p. lxiii, f. 3. The bird there represented is the *Lobipes Wilsonii* of Sabine.

XXV.

Here should come the genus Aramus, Vieill. characterized as follows.—Bill much longer than the head, cleft beneath the eyes, compressed, straight, curved, and somewhat turgid at tip; upper mandible slightly furrowed, the lower turgid towards the middle, angular beneath, acute; nostrils in wide orifices, linear, pervious; lores naked; feet long; toes divided to their base, hind toe long.

Ar. scolopaceus, Vieill. Brown glossed with green; feathers longitudinally white in the middle; rump, quill, and tail feathers immaculate. Inhabits Georgia and Florida, Bonap. Syn. p. 308.

XXVI.

The *Pel. sula*, L., The Brown Booby, Enl. 973, is the *Sula fusca*, Briss.

XXVII.

Closely allied to the genus PLOTUS is the HELIORNIS of Vieillot which chiefly differs from it in having a shorter and slenderer bill, the edges of which are entire, not denticulate. But two species are known, the *H. surinamensis*, Enl. 893. Brown, beneath whitish; sides of the neck striped with black and white; bill and feet dusky, the latter semi-palmate and barred with black. The other is the *H. senegalensis*, Vieill. Gal. 280. Brown, beneath white; sides of the neck and back speckled with black; bill and feet red; toes connected only at the base; tail cuneiform.

CATALOGUE

OF

THE MAMMALIA AND BIRDS OF THE UNITED STATES.

MAMMALIA.

CARNARIA.

CHEIROPTERA.

Vespertilio carolinensis
lucifugus, L. C.
noctivagans, L. C.
Plecotus macrotis, L. C.
Nycticea noveboracensis
crepuscularis, L. C.
cynocephalus, L. C.

INSECTIVORA.

Sorex(1)
Condylura cristata
Scalops aquaticus

CARNIVORA.

PLANTIGRADA.

Ursus americanus
horribilis
Procyon lotor
Meles labradoria
Gulo luscus

(1) We have many species of this genus in the United States, but not one that has yet been properly determined.

DIGITIGRADA.

Putorius vulgaris
erminea
lutreola
Mustela martes
Pennantii
Mephitis putorius
Lutra brasiliensis
Canis lupus
lycaon
vulpes
cinereo-argenteus
Felis discolor
rufa
borealis

AMPHIBIA.

Phoca vitulina

MARSUPIALIA.

Didelphis virginiana

RODENTIA.

Sciurus carolinensis
cinereus
vulpinus
macrourus
grammarus
4-vittatus
hudsonius
striatus
lateralis
Pteromys volucella
hudsonia
Arctomys monax
Hoodii
Mus musculus
rattus
decumanus
Meriones canadensis
labradorius
Fiber zibethicus
Hypudæus xanthognathus
riparius? Ord
hispidus
messor, L. C.
floridanus
gossypinus, L. C.
Psammomys pinetorum, L. C.
Saccomys bursarius
Castor fiber
Hystrix dorsata
Lepus variabilis
americanus

RUMINANTIA.

Cervus alces
canadensis
Cervus virginianus
macrotis

Antilope lanigera
furcifer
Ovis Ammon
Bos bison

CETACEA.

Delphinus Delphis
phocæna
Delphinus orca
Balæna mysticetus

AVES.

ACCIPITRES.

DIURNÆ.

VULTURINÆ.

Cathartes aura
Carthartes jota

FALCONES.

†Nobiles
Falco communis
Cooperi, Bonap.
sparverius
fuscus
columbarius
††Hierofalcones
Falco atricapillus
†††Aquilæ
Falco fulvus
haliætos
leucocephalus
††††Astures
Falco palumbarius
pennsylvanicus
†††††Milvi
Falco furcatus
dispar, Temm.
plumbeus, Gm.
††††††Buteones
Falco lagopus
Sancti Johannis
borealis
†††††††Circi
Falco hyemalis
pygargus

NOCTURNÆ.

†Oti
Strix nævia
otus
brachyotus
††Striges
Strix flammea
††† Bubones
Strix magellanica
Strix cinerea
††††Noctuæ
Strix funerea
nyctea
cunicularia
acadica
†††††Ululæ
Strix nebulosa

PASSERINÆ.

DENTIROSTRES.

Lanius ludovicianus
septentrionalis
†Tyrannus
Muscicapa tyrannus
crinita
verticalis, Bonap.
forficata
††Muscicapa
Muscicapa Sayi, Bonap.
fusca
virens
ruticilla
Vireo flavifrons
solitarius
noveboracensis
gilvus
olivaceus
Bombycilla garrula
americana
carolinensis
Tanagra æstiva
rubra
ludoviciana
Turdus polyglottos
migratorius
lividus
rufus
minor
mustelinus
Wilsonii, Bonap.
Myothera obsoleta, Bonap.
†Saxicolæ
Motacilla sialis
††Sylviæ
Motacilla aurocapilla
noveboracensis
coronata
palmarum
Motacilla maculosa
maritima
pardalina, Bonap.
mitrata
pensilis
virens
Blackburniæ
icterocephala
castanea
striata
varia
pinus
parus
tigrina
rara
discolor
æstiva
pulchra
americana
canadensis
agilis
formosa
autumnalis
trichas
philadelphica
sphagnosa, Bonap.
azurea
cœrulea
†††Reguli
Motacilla calendula
cristata
Troglodytes aedon
europæus
palustris
ludovicianus
Anthus spinoletta
Icteria dumicola

FISSIROSTRES.

†Cypseli
Hirundo pelasgia
††Hirundines
Hirundo purpurea
rufa
fulva
Hirundo bicolor
riparia
Caprimulgus carolinensis
virginianus
vociferus

CONIROSTRES.

Alauda alpestris
Parus bicolor
atricapillus
Emberiza nivalis
Pyrgita iliaca
erythrophthalma
†Spizæ
Fringilla amœna, Bonap.
cyanea
ciris
††Passeres
Fringilla americana
leucophrys
grammaca
pennsylvanica
graminea
melodia
savanna
nivalis
passerina
laponica
canadensis
socialis
pusilla
palustris
caudacuta
maritima
†††Cardueles
Fringilla tristis
psaltria
pinus
linaria
Coccothraustes cardinalis
vespertina, Bonap.
ludoviciana
cœrulea
purpurea
Pyrrhula frontalis, Bonap.
Loxia curvirostra
leucoptera
Corythus enucleator
Xanthornus baltimorus
spurius
phœniceus
xanthocephalus
pecoris
agripennis
Dacnis vermivora
prothonotarius
solitarius
chrysoptera
peregrina
rubricapilla
ciliata, Bonap.
Sturnus ludovicianus

CORACES.

Corvus corone
corax
ossifragus
Corvus columbianus
pica
Garrulus cristatus

Garrulus floridanus
canadensis
Quiscalus major
Quiscalus versicolor
ferrugineus

TENUIROSTRES.

Sitta canadensis
carolinensis
pusilla
Certhia familiaris
Trochilus colibris
Alcedo alcyon

SCANSORIÆ.

Picus auratus
principalis
pileatus
erythrocephalus
carolinus
varius
villosus
Picus pubescens
querulus
torquatus
tridactylus
Cuculus americanus
erythrophthalmus
Psittacus carolinensis

GALLINACEÆ.

Meleagris gallopavo
Tetrao canadensis
obscurus
urophasianus, Bonap.
umbellus
cupido
phasianellus
albus
Perdix virginiana
californiana
Columba fasciata, Bonap.
zenaida, Bonap.
leucocephala
passerina
migratoria
carolinensis

GRALLATORIÆ.

PRESSIROSTRES.

Charadrius semipalmatus, Bonap.
melodus
Wilsonii
vociferus
Charadrius pluvialis
Squatarola helvetica
Hæmatopus ostralegus

CULTRIROSTRES.

Grus canadensis
americana
†Ardeæ
Ardea Herodias

Ardea alba
Pealii, Bonap.
candidissima
ludoviciana
††Botauri
Ardea violacea
Ardea nycticorax
cœrulea
minor
virescens
Tantalus loculator
Platalea ajaja

LONGIROSTRES.

Ibis rubra
alba
Numenius longirostris
hudsonicus
borealis
Scolopax minor
paludosa
Limosa ægocephala
fedoa
Calidris maritima
Temminckii
minuta
pusilla
islandica
Arenaria calidris
Pelidna alpina
subarcuata
Schinzii
pectoralis
platyrhynca
maritima
Machetes pugnax
Hemipalama semipalmata, Bonap.
Phalaropus fulicarius, Bonap.
Totanus semipalmatus
melanoleucus
flavipes
Bartramius
solitarius
macularius
Lobipes hyperborea
Wilsonii, Bonap.
Himantopus nigricollis
Recurvirostra americana
Rallus crepitans
virginianus
carolinus
noveboracensis
Gallinula martinica
chloropus
Fulica americana
Phœnicopterus ruber

PALMIPEDES.

BRACHYPTERÆ.

Podiceps cristatus
subcristatus
cornutus
carolinensis
Colymbus glacialis
septentrionalis
Uria grylle
Uria troile
Brunnichii, Sab.
Cephus alle
Fratercula cirrhata
arctica
Alca torda

LONGIPENNES.

Procellaria Wilsonii, Bon.
Leachii, Bonap.
glacialis
Larus minutus
capistratus
atricilla
tridactylus
canus
eburneus
fuscus
argentatus
argentatoides
leucopterus
glaucus
Larus marinus
Lestris cataractes
pomarina
Buffonii
paradisea
Sterna cayana
anglica
hirundo
arctica
minuta
nigra
fuliginosa
stolida
Rhynchops nigra

PALMATÆ.

PELECANI.

Pelecanus onocrotalus
fuscus
Phalacrocorax carbo
graculus
cistatus
Tachypetes aquilus
Sula bassana
fusca
Plotus melanogaster
Heliornis surinamensis
Phaeton æthereus

LAMELLIROSTRES.

Cygnus musicus
Anser hyperboreus
albifrons
segetum
canadensis
leucopsis
bernicla
Anas nigra
glacialis
fusca
perspicillata
histrionica
Stelleri
clangula
albeola
mollissima
spectabilis
ferina
Anas valisneriæ
marila
fuligula
labradora
rubida
clypeata
acuta
boschas
sponsa
strepera
americana
obscura
crecca
discors
Mergus merganser
serrator
cucullatus
albellus

EXPLANATION OF THE PLATES.

Plate I. The Quadrupeds of this plate are sufficiently described in the text, for which refer to the genera by the Index.

Plate II. This plate exhibits the osteology of the head of two anomalous Mammalia.

Fig. 1, 2, 3. The Aye-Aye (*Cheiromys*, C.), which, with the teeth of the Rodentia, possesses a head very similar to that of the Quadrumana, and principally as relates to the zygomatic arch, the orbit, &c.

Fig. 4, 5, 6. The Phascolomys, which also has the teeth of the Rodentia united to a head very analogous to that of the Carnaria, and evidently closely allied to that of the Phalangers.

Plates III and IV. The Birds of this plate are sufficiently described in the text under their respective genera.